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OLD PEOPLE LIVING IN DORSET

A SOCIO-MEDICAL SURVEY OF PRIVATE HOUSEHOLDS

BY

W. H. SIMONDS AND ALICE STEWART

From the Dorset County Health Department, and the Social Medicine Unit, University of Oxford

The present investigation is part of a more comprehensive study of old people living in Dorset (Simonds, 1954). The main survey, which was sponsored by the Health and Social Services Committee of the Dorset County Council, had as its immediate objectives:

(1) to discover the extent and nature of latent welfare needs among old persons living in the county;

(2) to decide which of the permissive clauses in Part III of the National Assistance Act (where the responsibilities of the local authorities towards disabled, infirm, and aged persons are outlined) should be recommended by the Health Committee.

The facts required were partly medical and partly social, and three categories of old people had to be considered:

(*i*) inmates of institutions for the aged,

(*ii*) tenants of almshouses, bungalows, and flats reserved for the use of old people,

(*iii*) tenants or owners of other dwelling houses.

Only the findings in respect of the third group are described here.

Choice of Sample

At the time of the Survey the most up-to-date estimates of the sex and age distribution of the civilian population were those for December 31, 1947 (General Register Office, 1949). According to these, a random sample of 500 persons over the age of 65 in the Administrative County of Dorset would have included approximately 212 persons from the large towns (over 30,000 inhabitants), 104 from smaller towns, and 184 from rural districts. By placing these three types of locality in order of population density and applying the block number method of random selection (Yates, 1949), six localities were chosen to represent the county. These were Poole and Weymouth (representing large towns), Dorchester and Swanage (smaller towns), and Wimborne and Wareham (rural districts).

The National Register had been withdrawn before the survey began. It was necessary, therefore, to obtain the 500 old persons indirectly through the Rating Valuation list of houses. The random sampling procedure, which is described in detail elsewhere (Simonds, 1954), aimed at obtaining 54 interviews with old persons living in municipally owned houses, 332 with old persons in private houses rated at £20 per annum or less, and 114 in private houses of higher rateable value. It did not, however, allow for the fact that the official housing policy is heavily weighted against old persons. Consequently even a calculated excess of houses failed to produce the fixed quota of old persons in municipally owned houses (Table I). The number of successful interviews was further reduced for the following reasons:

Reason for Not Interviewing	Men	Women
Interview refused	7	10
Moved house*	6	13
Died	6	10
General practitioner's advice† ..	1	2
Admitted to hospital for life ..	1	2
Under 65 years	3	7
Total	24	44

* The interval between identifying the houses which contained old people and calling on them ranged from 3 to 12 months.

† In every case the General Practitioner was consulted before seeking an interview.

Eventually 172 men and 282 women were interviewed in their homes by one of us (W.H.S.) and facts collected under the following headings were recorded on standard schedules:

Age, civic status, past and present occupations;
Age and reasons for retirement;
Birthplace and period spent in present locality;
Detailed specification of house and fellow occupants;
Feeding habits, income, and recreations;
Any operations, illnesses, and accidents which had caused residual disability or had occurred since the age of 60;
Current symptoms;
Medical assistance received during the last 12 months.

Social Data

The ratio of males to females and the average ages of the men and women (Table I) were much the same as the 1951 Census Estimates for the Southern Region (General Register Office, 1954). There were, however, within the survey group relatively more women and less men among the under 70s and over 80s than in the middle age group (Table II). The

TABLE I

SELECTION OF SURVEY GROUP FROM RATING VALUATION LIST OF HOUSES

Region	Housing Grades*	Fixed Quota of 500 Persons over 65 years	No. of Houses on Sample Address List	No. of Old Persons living in These Houses	No. of Successful Interviews	
					Male	Female
Large Towns	1	25	69	18	6	11
	2	127	275	130	46	68
	3	60	149	68	24	36
	Total	212	493	216	76	115
Small Towns	1	13	39	12	4	7
	2	61	130	71	21	40
	3	30	70	35	11	19
	Total	104	239	118	36	66
Rural Districts	1	16	50	7	3	4
	2	144	305	147	48	82
	3	24	61	34	9	15
	Total	184	416	188	60	101
All Regions	1	54	158	37	13	22
	2	332	710	348	115	190
	3	114	280	137	44	70
	Total	500	1,148	522	172	282

* (1) Municipally owned houses.
(2) Other houses with rateable value of £20 p.a. or less.
(3) Other houses with rateable value over £20 p.a.

TABLE II

COMPARISON OF SURVEY GROUP WITH 1951 CENSUS ESTIMATES

Data			Survey Group		1 Per cent. Census Sample, 1951 (persons over 65 yrs)	
			Male	Female	Male	Female
Sex Ratio			1 : 1·6		1 : 1·56*	
Average age (yrs)			73·1	73·0	72·8	73·6*
Marital Status	Partner over 65		45·3	27·6	67·4	34·3*
	Partner under 65		20·4	7·2		
	Partner deceased or separated		27·9	44·3	23·6	47·1*
	Single		6·4	20·9	9·0	18·6*
Social Class	I and II		24	—	24	—
	III		40	—	44	—
	IV and V		36	—	33	—
Income	Still gainfully employed		19·8	6·4	34·5	9·5†
	Receiving state pension		74	69	66	67‡
Companionship	Alone		5·8	18·1	2·9¶	
	With over 65s only		33·6	33·6	—	
	With younger generation/s		20·4	28·4	—	
	Single household		17·9		13·7¶	
Housing	Fixed bath	Urban	73		72**	
		Rural	46		58**	
	W.C.	Urban	99		93**	
		Rural	46		65**	

* Southern region (** *all* households in Southern region). † Great Britain. ‡ From third report of Ministry of National Insurance.
¶ All households in Great Britain.

survey group also appeared to be representative of the Southern Region in respect of the number of married persons and the social class distribution of the men, but compared with the country as a whole it contained an exceptionally high proportion of spinsters and retired men in receipt of State pensions.

HOUSING.—Comparisons between all houses in the Southern Region and the survey houses showed that the old people living in towns were well supplied with fixed baths and W.C.s, but that the rural dwellers were at a disadvantage in these respects.

A more detailed picture of the survey houses can be obtained from the figures shown in Table III. According to these there was no evidence of overcrowding, but nearly 20 per cent. of the rural houses were grossly substandard in respect of structure, fixtures, and furnishings. Assuming that the survey group is typical this suggests that the villages of Dorset contain nearly 2,000 such houses occupied by old people. The corresponding estimate for the towns is in the region of 200.

TABLE III

LIVING CONDITIONS

Household Amenities		House Score	No. of Houses	
			Urban	Rural
Water Supply and Drainage	Bath and W.C.	+5	164	48
	Bath only	+2	—	6
	W.C. only	+3	57	6
	Neither	0	3	56
Dangerous Staircase		−1	29	16
Structure of Building	Satisfactory	+3	155	55
	Needing minor repair	+2	49	35
	Needing major repair	+1	20	26
Telephone		+1	45	23
Furnishings	Generous	+3	59	16
	Adequate	+2	109	44
	Poor	+1	56	56
Density Ratio*	More than 1 room per person		194	97
	One room per person		15	17
	Less than 1 room per person		15	2
House Score (see col. 2)	9–12 Good		121	41
	5–8 Satisfactory		82	13
	3–4 Barely adequate		18	42
	0–2 Grossly sub-standard		2	20
Total Houses			224	116
Total Persons			293	161

*House score (−1) if the old persons have no room to themselves.

RETIREMENT DATA (Table IV).—At the time of the survey, one-fifth of the men were still in paid work, of whom approximately one-third had recently changed to a less strenuous occupation. Less than 25 per cent. of the men had retired before the age of 65, and over 50 per cent. had continued working after this age. Among the retired men (138) were 55 who had held jobs with a fixed age of retirement and 62 who had been forced to retire by ill health.

Within the much smaller group of women who had been in paid employment (106), only 54 had continued working after the age of 60, and thirty had had to give up work for reasons of health.

TABLE IV

RETIREMENT

Data		Male	Female
Still in paid work	Usual employment	25	18
	Recent change	9	—
Retired	Before statutory age*	41	41
	At statutory age	41	11
	At later date	56	36
Reasons for retirement	Ill health	62	30
	Own choice	21	33
	Fixed age of retirement	55	25
Housewives and others not gainfully employed			176
Total		172	282

* 65 for men, 60 for women.

FINANCIAL CIRCUMSTANCES.—Approximately one-quarter of the men and one-third of the women who were interviewed had made no attempt to claim their old age pensions. A further 58 per cent. of the men and 47 per cent. of the women had private incomes which they combined with their statutory allowances, leaving only 28 men and 57 women who were financially dependent on the State. In this group half the men and three-quarters of the women had successfully claimed supplementary allowances. Only three persons (all women) refused to disclose the source of their income.

DOMESTIC ARRANGEMENTS AND DIET.—The proportion of old persons who could rely on a fellow resident for domestic help was higher for the men (89 per cent.) than for the women (50 per cent.), and slightly better for the town dwellers (68 per cent.) than the villagers (55 per cent.). Several women still ran their houses unaided, and were content to know that relatives or friends were available for emergencies. There were, however, five men and 29 women who were unable to say what would happen in such an event. In the vast majority of cases relatives or friends did what extra domestic work was required, and there was no question of direct payment for services. There were, however, fifteen men and seventeen women who could afford to pay for—and had obtained—a resident maid or housekeeper.

Where the husband was on the retired list it was customary to find him doing some of the day-to-day work about the house, but the frequent exceptions to this rule are reflected in the finding that 61 per cent. of the women did all the household cooking and shopping and a further 12 per cent. did all the cooking and most of the shopping. Among the men, 57 per cent. had neither shopped nor cooked and a further 26 per cent. only shopped occasionally.

For the group as a whole feeding habits appeared to be satisfactory. There were, however, a small number (six men and fifteen women) who were on special diets prescribed by their doctors and a still smaller number (six men and ten women) who habitually took uncooked meals of the "bread and marge" variety. Of the latter three lived alone and seven were said to be either eccentric or mentally subnormal.

LONELINESS.—In answer to a direct question eight men and 52 women admitted that they felt lonely. For persons under 80 years of age this group represented 2 per cent. of the men and 16 per cent. of the women. Above this age it included 16 per cent. of the men and 27 per cent. of the women. Among the men there was no significant difference between villagers and town dwellers, but among the women loneliness was distinctly more common in the rural areas. As might be expected this particular complaint was rare among the old people who were living as man and wife and relatively common among those who had recently moved into the district.

MEDICAL DATA

On the basis of what the general practitioners had to say about their patients and what was noted at the time of the interview, each person was placed in the appropriate physical, mental, and prognostic grade.

PHYSICAL GRADES

Grade 1.—All persons who, in addition to appearing fit, were both free from minor disabilities (*e.g.* bunions, callosities, varicose veins, hernia, moderate deafness, impaired vision, etc.) *and* had not experienced any illness which was likely to recur or lead to other troubles (*e.g.* raised blood pressure, recurrent attacks of bronchitis, arthritis etc.). Loss of teeth was not regarded as a disability provided adequate substitutes were in use.

Grade 2.—As for Grade 1, except for the existence of minor disabilities.

Grade 3.—All other persons who appeared to be in good health at the time of the interview.

Grade 4.—Up and about but unable to go far alone and not fit to do their own housekeeping.

Grade 5.—Periodically or permanently confined to bed.

MENTAL GRADES

Grade 1.—Reasoning powers, personality, and memory all sound.

Grade 2.—Reasoning powers and personality sound, but noticeable loss of memory.

Grade 3.—Rational but liable to upset fellow occupants, etc.

Grade 4.—Irrational.

PROGNOSTIC GRADES

Grade 1.—Likely to remain in good health for some time.

Grade 2.—Apparently fit but prognosis uncertain.

Grade 3.—Manifestly unfit and unlikely to recover.

By all three criteria the men were clearly more fit than the women (Table V). These sex differences tended to increase with the years, and after the age of 80 there was five times as much physical invalidism among the women as among the men, and nearly three times as many instances of mental disorder. In the higher mental and physical grades the sex differences were less marked than in the lower grades, and when all disabilities and age groups were merged the good prognostic indications were nearly as common among the women as among the men.

TABLE V

PHYSICAL, MENTAL, AND PROGNOSTIC GRADES

Grades		Male				Female			
		60s	70s	80s	All Ages	60s	70s	80s*	All Ages
		No.	No.	No.	Per cent.	No.	No.	No.	Per cent.
Physical ..	1	22	22	7	29·7	25	37	6	24·2
	2	14	19	4	21·5	27	32	5	22·6
	3	12	31	9	30·2	27	38	9	26·2
	4	4	21	4	16·9	5	32	16	18·8
	5	1	1	1	1·7	4	7	12	8·2
Mental ..	1	36	54	17	62·0	53	76	21	53·2
	2	15	37	6	33·3	28	65	19	39·7
	3	2	2	1	3·5	6	4	6	5·7
	4	—	1	1	1·2	1	1	2	1·4
Prognostic..	1	34	40	11	49·4	56	65	13	47·5
	2	14	30	7	29·6	20	45	7	25·5
	3	5	24	7	21·0	12	36	28	27·0
Totals ..		53	94	25	100	88	146	48	100

* Including three women over 90.

PRINCIPAL DEFECTS, TEETH, AND OTHER SYMPTOMS.—Systematic questioning elicited the number of persons who suffered from certain well-known complaints of old age. These answers, together with the histories of illnesses, accidents, and operations and the reports from general practitioners, made it possible, in a given case, to decide which of fifteen

"principal defects" (allowing only one for each person) was causing the most trouble (Table VI). In practice, eight of these headings sufficed for over 85 per cent. of the group.

TABLE VI

PRINCIPAL DEFECTS, TEETH, AND OTHER SYMPTOMS

Defects*		Percentage		Number of Persons
		Males	Females	
Principal Defects	Nil	26·1	20·5	103
	Cardiac	12·7	17·4	74
	Locomotor	8·2	17·7	67
	Visual	10·4	7·8	40
	Pulmonary	6·8	6·7	31
	Gastric	6·6	5·7	27
	Auditory	6·6	5·4	26
	Personality	3·5	6·0	23
	Varicosities	2·8	5·4	20
	Genito-urinary	5·2	1·1	12
	Hernias	5·8	0·4	11
	Skin	1·7	1·4	7
	General debility	1·2	1·7	7
	Anaemia	1·2	1·4	3
	Endocrine	1·2	1·4	3
Teeth	Own teeth adequate	6·6	3·2	20
	Dentures	64·0	78·6	331
	Other (grossly defective)	29·4	18·2	103
Other Symptoms	Impaired sight	47·0	58·0	245
	Painful feet	34·8	51·0	202
	Dyspnoea	38·4	43·2	188
	Giddiness	33·3	42·5	179
	Deafness	30·7	26·9	129
	Oedema	1·7	13·9	42
	Angina	4·1	3·9	18
	Tremor	4·1	2·1	13
Number of Symptoms recorded per Person	0	19·1	12·1	67
	1	22·7	21·0	98
	2	23·2	21·8	102
	3	19·2	20·0	89
	4	10·4	13·1	55
	5	4·7	8·1	31
	6	0·7	3·9	12

* Arranged in order of frequency, allowing only one defect per person

Arranged in this way there were only three noteworthy differences between males and females. On the one hand disturbances of locomotion (arthritis, rheumatism, etc.) were three to four times as important among the women as among the men, and on the other, hernias were ten times and genito-urinary troubles three times as important among the men. "Nil defects" headed both the lists, and if the three exceptions already mentioned are excluded the rank order of all but one of the remaining groups was the same for both sexes. The single deviation is due to the fact that disturbances of personality take sixth place in the female list and tenth place in the male list.

The women appeared more frequently in the list of symptoms than the men, averaging 2·41 symptoms per person as against 1·95 for the men. Swelling of the legs was not a frequent complaint but was nearly six times as common among females as males. Women also suffered from painful feet and giddiness to a greater degree, but tremor (also rare) was found more often among men.

When the eight symptoms were studied in relation to one another, certain characteristic combinations were revealed. Thus, impaired sight tended to go hand in hand with dyspnoea and deafness. Giddiness was more frequently associated with dyspnoea, painful feet, impaired vision, oedema, and angina than would be expected if there had been nothing but chance association; dyspnoea also had a significant association with oedema and angina; in spite of their infrequent appearance, oedema and tremor overlapped.

PATHOLOGICAL CONDITIONS OCCURRING FOR THE FIRST TIME OR PERSISTING AFTER AGE 60.—Nearly 150 of the pathological conditions listed in the International Classification of Diseases and Injuries (W.H.O., 1949) were represented in the sample. Not including recurrences, and naming only conditions which occurred for the first time after the age of 60 or had left residual signs, the men shared 330 conditions and the women 612 (Table VII overleaf). Just over 12 per cent. of the men and 8·5 per cent. of the women said that they had remained well during this period, and in 62 cases four or more conditions were superimposed. Though the women were rather more often affected, the average number of conditions per person was not significantly different for the two sexes.

Foot defects (202) headed the list, and these, combined with other diseases of bones and joints (115), were about three times as common as diseases of the heart and arteries (115) or acute and chronic diseases of the lungs (93). It is likely that an exhaustive examination would have yielded some evidence of arterio-sclerosis or venous incompetence in every single person, but over two-thirds of the group had escaped manifest disease of the heart and blood vessels. Major injuries (46) and diseases of the skin (47), eye (43), intestines (41), and genito-urinary tract (44) were almost equally common, but after these there were only two disease groups, namely personality defects (32) and hernias (39), with more than a dozen examples.

There was a general tendency for those over 80 years old to have a higher incidence of pathological conditions than the younger persons, but except for vascular and pulmonary diseases the accretions were not at all numerous. In spite of more years of exposure to risk major injuries were actually less common among the men and women who had survived to the oldest age group than in those who

were still below the age of 80. This could equally well be due to the fact that accident proneness and longevity are incompatible, or to the fact that the older members of the Survey group failed to report every major injury which had happened in the last 20 or 30 years.

Several of the more common pathological conditions were equally distributed between the men and the women—notably respiratory infections, strokes and other conditions due to hardening of the arteries, eye diseases, and skin lesions. Hernia was distinctly a disease of men as, to a lesser extent, was peptic ulcer. There were, however, many more conditions which showed a female bias (*e.g.*, injuries, arthritis, herpes, cancer, personality defects, appendicitis, gall stones, and the less common forms of heart disease).

TABLE VII

DISEASES OCCURRING OR PERSISTING AFTER THE AGE OF 60

Diagnostic Group	Male				Female			
	60s	70s	80s	All Ages (per cent.)	60s	70s	80s	All Ages (per cent.)
All Fractures and Major Injuries	5	5	3	7·6	6	18	11	12·4
Hernias	10	19	6	20·3	1	3	—	1·4
Foot Defects	24	27	9	34·9	46	69	27	50·4
Arthritis, Fibrositis, etc.	6	21	8	20·3	22	39	19	28·4
Herpes Zoster	1	1	—	1·2	1	7	2	3·5
Other Skin Diseases	8	6	3	9·9	11	12	7	10·6
Cancer (all sites)	—	2	—	1·2	4	2	1	2·5
Diabetes	—	2	—	1·2	—	1	—	0·4
Personality Defects	1	4	1	3·5	9	10	6	8·9
Vascular Accidents of C.N.S.	1	4	1	3·5	1	4	6	3·9
Other Arteriosclerosis	10	14	3	15·7	9	29	14	14·9
Other Cardiac	—	4	—	2·3	5	7	3	5·3
Varicosities	1	5	2	4·7	10	16	4	10·6
Acute Respiratory	4	10	5	11·0	10	19	4	11·7
Chronic Respiratory	2	14	3	11·0	6	16	5	9·6
Gastric and Duodenal	8	6	1	8·7	3	9	2	5·0
Other Intestinal	—	3	1	1·7	5	8	5	6·4
Genital	3	8	4	8·1	2	9	1	4·3
Urinary	1	5	2	4·7	2	5	2	3·2
Blood	—	1	2	1·7	—	2	—	0·7
Cataract	2	3	5	5·8	4	7	4	5·3
Other Eye Diseases	2	3	3	4·7	3	10	6	6·7
Severe Deafness	3	4	6	7·6	3	7	11	7·4
No Illnesses or Accidents	8	12	1	12·2	11	11	2	8·5
No. of Persons	53	94	25	172	88	146	48	282

All cases of moderate deafness and faulty sight due to hypermetropia have been omitted, also five cases of obesity and three of goitre.

Except in the case of injuries, repeated episodes of the same condition are not included.

ARRANGEMENTS FOR MEDICAL SUPERVISION.—During the 12 months which preceded each interview, 228 of the old persons had sought medical advice (Table VIII). A further six had not consulted a doctor but had experienced an illness which kept them in bed for more than 10 days, and ten who had had no reason to consult their doctor had been treated by a chiropodist.

The total number attending chiropodists was five men and 28 women. Only 41 had been referred to hospitals; of these 26 had been admitted and five were on the waiting list.

TABLE VIII

ARRANGEMENTS FOR MEDICAL SUPERVISION DURING 12 MONTHS PRECEDING INTERVIEW

Type of Medical Attention			Males	Females	Both Sexes (per cent.)
Hospital†	Out-patient only		3	7	2·2
	Awaiting admission		1	4	1·1
	In-patient		11	15	5·7
General Practitioner	Acute bed illness*		24	52	16·8
	Other home supervision		7	31	8·4
	Attended surgery**		51	75	2·8
No Medical Supervision	Acute bed illness		3	3	1·3
	No acute illness		87	123	46·3
Nursing Arrangements	Acute bed illness	Relative or friend (unpaid)	17	30	10·0
		District nurse, etc.	7	22	6·4
		Managed alone	3	3	1·3
	Other home supervision	Relative or friend (unpaid)	3	18	4·6
		District nurse, etc.	3	11	3·1
		Managed alone	1	2	0·7
Chiropody	Only		1	9	2·2
	With other supervision		4	19	5·1

† The method of sampling automatically excluded old persons who had been admitted to hospital for an indefinite period (see page 139).

* Defined as an acute illness necessitating more than 10 consecutive days in bed.

** Surgery visits were 40 per cent. less frequent in rural areas than in town.

Acute bed illnesses (not counting episodes which lasted less than 10 days) were equally distributed between the two sexes, as were also visits to the doctor's surgery. More prolonged home supervision by a general practitioner—usually for incurable conditions—was, however, three times more often required for the women than for the men, and visits to the surgery were over twice as frequent among town dwellers as among villagers.

Regarding the nursing arrangements, it was interesting to observe that nearly two-thirds of the services were provided (usually free of charge and often at the cost of giving up paid work) by relatives or friends. In this respect there was no difference

between the men and the women or between the towns and the rural areas. Most of the trained nurses were provided by the Local Authority, but in a few cases a private nurse had been engaged. In eight cases (all women) there was clear evidence that the prolonged ill health of the old person was putting such a heavy load on available resources that these were about to break down under the strain.

If the Survey findings are representative, about 20,000 old persons in Dorset regularly consult their general practitioners and over 3,000 are treated in hospital every year. District Nurses are called upon to attend between 2,000 and 3,000 cases of acute illness and a further 1,000 persons with chronic complaints.

Meanwhile relatives and friends are shouldering the day-to-day responsibilities of nearly 4,000 cases of acute illness and 2,000 cases of chronic illness among old persons. To check these estimates the visiting lists of District Nurses practising in Poole were inspected. During the years 1950 and 1951 these nurses paid 2,044 "first visits". Since approximately one-third of the old people in Dorset live in Poole these lists correspond to approximately 3,400 visits per year for the County as a whole—a figure very close to the one based on the survey estimates.

Discussion

With monotonous regularity surveys demonstrate that old people are less well placed and less healthy than their younger brothers and sisters and that more women survive to old age than men. Yet we are still far from knowing the measure of a problem which is steadily increasing in size and importance. One reason is that, in spite of all that has been written on the subject of old age, there are only three recorded surveys in the British Isles where the data were collected by a medical practitioner paying home visits to a representative sample of the population (Walker, 1947; Sheldon, 1948; Adams and Cheeseman, 1951). To quote the words of Sheldon, such an approach "does not make for ease of working: all sorts of inaccessible personalities may be encountered, and it is very time-consuming, but the degree of self selection imposed by the population on itself in regard to its approach to doctors inevitably gives anything other than a random sample a considerable bias".

The Poor Law method of dealing with people who had outlived their strength and had neither relatives nor money to supply the deficiency was to offer them accommodation in a workhouse infirmary. Nowadays this policy is frowned upon. Yet we are still nervously aware that it is easier to say that old infirm people should not be immured in institutions than to make it possible for them to live at home. Since it is unlikely that an ideal scheme will be devised until we know more about the natural history of old age, it is reasonable to suggest that any record of the situation as it exists to-day is relevant.

In the present investigation we have tried to size up the situation in Dorset by identifying a sample of old people who are still fending for themselves and by recording their home background and medical condition. Our attempts to judge the latter have been focussed on three things: prognostic indications, principal disabilities, and all major illnesses occurring or persisting after the age of 60.

To obtain significant correlations between the two types of data, many more than 454 old persons should have been interviewed, but even a bare statement of the findings under the several headings has yielded facts of general and local interest. It has, for instance, been shown that, although a high proportion of old persons living in Dorset are unsuitably housed, their share of property owned by the local authority is lamentably small. No doubt this is due to the fact that here, as elsewhere, a high ratio of persons per room is a more effective criterion for rehousing than a low standard of repairs and amenities (Weir, 1953). It is, however, a reminder that housing priorities should be differently graded for old and young households if we are to avoid on the one hand, unnecessary inflation of the demand for old people's hostels and, on the other, the freezing of property which is more suited to the needs of youth than age.

Other findings of sociological interest are the number of households with no-one under the age of 65, the number of men who would like to go on working after 65 years of age, and the relatively large number of women (widows and spinsters) who live alone. On the medical side it has been noted that, in spite of there being more manifestly unfit women than men, the prospect of remaining in good health for some time was almost equally good for the two sexes and applied to nearly half the group.

Many more supporting facts would be required before we could say that the public facilities for old people in Dorset are the best that the county can afford, or that the findings in this county are typical of the population at large. But perhaps enough has been said to show that among the most important facts required to make these assessments are those which can only be supplied by surveys focussed on randomly selected groups of old people in which experienced physicians interview the subjects in their own homes.

SUMMARY

A survey of the health and living conditions of old people living in private houses in Dorset has shown that on nearly all counts the welfare needs of women are numerically greater than those of men, and that the housing problems in rural areas are of a totally different order from those in the towns.

We are indebted to Dr. A. A. Lisney, County Medical Officer of Health for Dorset, for permission to publish the results of this investigation and for much help and advice. We should also like to record our grateful thanks to the general practitioners, health visitors, and old people who made the survey possible.

REFERENCES

Adams, G. F., and Cheeseman, E. A. (1951). "Old People in Northern Ireland", Report to the Northern Ireland Hospital Authorities, Belfast, pp. 25–47.

General Register Office (1949). "Estimates of the Sex and Age Distribution of the Civilian Population of England and Wales at December 31, 1947". H.M.S.O., London.

— (1952). "Census 1951. Great Britain ONE per cent. Sample Tables, parts I and II." H.M.S.O., London.

Sheldon, J. H. (1948). "The Social Medicine of Old Age." Oxford University Press, London.

Simonds, W. H. (1954). "The Care of Old People. Report of a Domiciliary Survey of persons over the Age of 65 in Dorset." M.D. Thesis, Cambridge. Published for the Trustees of the Nuffield Foundation.

Walker, J. V. (1947). *Med. Offr.*, **78**, 169.

Weir, J. H. (1953). *Publ. Hlth*, **67**, 7.

World Health Organization (1949). "International Statistical Classification of Diseases, Injuries, and Causes of Death". Geneva.

Yates, F. (1949). "Sampling Methods for Censuses and Surveys", p. 35. Griffin, London.

Brit. J. prev. soc. Med. (1954), **8**, 147–152

PREMATURE DISABLEMENT AND DEATH AMONG POST OFFICE WORKERS

BY

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From the economic as well as humanitarian point of view, disease which causes premature loss of life or working capacity is of importance and interest. Death before the age of 60 clearly represents a loss to the community of the breadwinner's skill and often entails the burden of the support of his family. The same is true of sickness absenteeism and chronic incapacitating disease which enforces retirement. We are familiar with the use of sickness and death rates in the study of the relations between work, age, and health; less has been written on the importance of the rate of retirement on grounds of ill-health as an index of economic loss and the interaction of work and injury or disease. For these reasons, we here present the results of a survey of the records of disabling illness and premature death among male established staff of the General Post Office during the period 1949 to 1952 inclusive.

POPULATION AND METHOD OF SURVEY

The established or permanent staff of the General Post Office is not, of course, representative of the national working population. On appointment, employees are subjected to a medical examination designed to exclude those already suffering from certain disorders such as rheumatic heart disease which might reduce their expectation of working life below the usual lower limit of 60 years of age. Their experience thus understates the economic importance of such diseases. On the other hand, complete records are kept of the cause of death or retirement on grounds of ill-health among all men on the permanent establishment of the G.P.O. Particulars of the cause of death were extracted from copies of death certificates submitted in connection with the payment of death gratuities. For members of the staff retired on grounds of ill-health, full clinical particulars, including hospital records where appropriate, are available. The criterion for such retirements is an inability to render regular and effective service, which is likely to be permanent, because of some infirmity of body or mind. This does not necessarily mean that the retired man is incapable of gainful employment, but only that the Post Office is unable to use his services effectively, since his capacity for work is usually seriously impaired. The decision to retire someone is customarily taken after a period of prolonged sick leave, but there is no fixed total amount of absence at which retirement on grounds of ill-health becomes automatic. Whether a man is regarded as having retired or as having died while still on the staff depends partly on administrative factors in relation to the progress of the disease. The classification of cases into retirements and deaths from certain causes is therefore rather arbitrary, and the two types of wastage must be considered together.

The coding of the causes of death or retirement follows the rules given in the 1948 International Statistical Classification of Diseases, Injuries, and Causes of Death. For deaths, difficulties seldom arose, but certain additional conventions were adopted in dealing with complex cases of retirement in which more than one disease was present. If one of these two or more conditions was, by itself, severe enough to justify retirement, that condition was coded as the cause of retirement. Multiple codings were used in some cases in which no one disease or injury would of itself have been an adequate reason for retirement. Although special inquiries were made if the medical reports left the diagnosis in doubt, no attempt was made to give a more exact coding than the clinical evidence warranted. Thus, if it was not clear whether an observed hypertension was benign or malignant in origin, the condition was coded under "other or unspecified hypertensive disease". Similarly, psychoses could often be classified only under the heading of "other and unspecified mental illness". Nevertheless, we would emphasize that the classification of causes was based not on medical certificates but on reasonably complete and accurate clinical reports.

The population covered by this survey comprises the occupational categories of established staff of the General Post Office employed during the years 1949 to 1952 inclusive for whom accurate age distributions of the numbers exposed to risk were available. They were divided by occupation into six major groups: (1) executive and clerical, (2) postal and telegraph officers and telegraphists, (3) telephonists, (4) postmen higher grade, (5) postmen, and (6) technical officers and technicians. Broadly speaking, the first four groups comprise indoor workers employed on tasks making little demand for

*Unfortunately Dr. C. G. Roberts died suddenly in Australia just before this paper went to press. At the time of its preparation he was Deputy Treasury Medical Adviser.

physical effort. Postmen, and the technicians employed on telephone construction and maintenance work, on the other hand, usually work outside for at least part of the day at tasks which are often physically arduous. The staff can thus be divided into "active" and "sedentary" workers.

Unfortunately, we can make no direct comparison between the death and ill-health retirement rates and the sickness-absence experience of the same population over the same period. We therefore refer, where appropriate, to the more restricted results of a morbidity sample survey conducted among the G.P.O. staff in the London area between mid-1948 and mid-1951. Technicians and technical officers were not included in this sample survey, and the grades of postmen were taken together, but the broad distinction between 'active' and 'sedentary' workers applies well enough for the morbidity data to be useful.

Results

The general pattern is seen in Table I and Fig. 1, where the age trends of retirement and death rates obtained in this study are compared with the age-specific sickness absence rates found in the London area morbidity survey. All three indices of labour wastage due to injury or disease increase appreciably after the age of 45; but of the three, the retirement rate appears to be the most sensitive indicator of the effect of ageing on the risk of disabling injury or disease. Further, if the retirement and death rates in each age group be added to give a measure of the total loss to the labour force, a rough calculation shows that, at these rates, some 27 per cent. of men aged 25 would be either dead or disabled before they reach the age of retirement at 60.

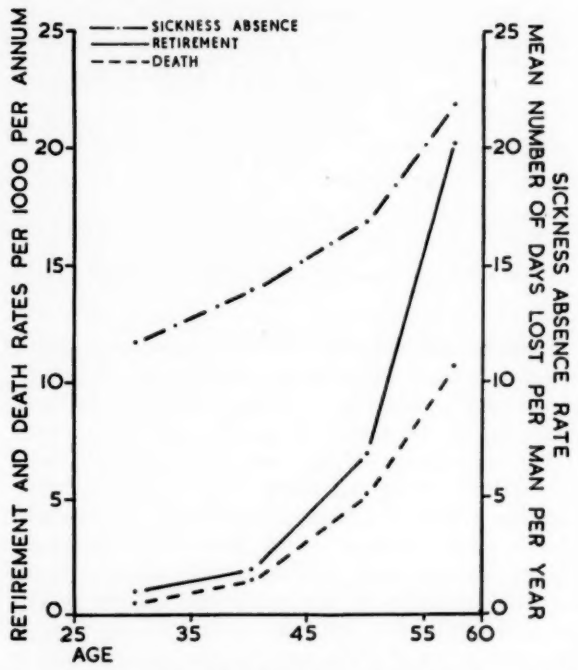

FIG. 1.— Ill-health retirements and deaths (per 1,000 per annum) and mean sickness absences (days per man per annum), by age.

TABLE I
ILL-HEALTH RETIREMENT, DEATH, AND SICKNESS ABSENCE RATES

Age Group (yrs)	Retirement		Death		Sickness Absence
	No.	Rate per 1,000 p.a.	No.	Rate per 1,000 p.a.	Mean number of days lost/man/year
25–34	176	1·0	79	0·5	11·8
35–44	308	1·8	248	1·4	14·1
45–54	1,060	6·9	820	5·3	17·0
55–59	1,209	20·3	645	10·8	22·0
Total	2,753	4·9	1,792	3·2	

Table II gives a more detailed analysis of the age-specific retirement and death rates according to

TABLE II
AGE SPECIFIC DEATH AND ILL-HEALTH RETIREMENT RATES BY

Age Group (yrs)		Causes of Retirement and Deaths						
		Tuberculosis 001–019*	Malignant Neoplasms 140–205	Allergic Endocrine, etc. 240–289	Mental Diseases 300–326	Suicide E970–979	Nervous System 330–393	Circulatory System 400–468
Retirements	25–34	0·27 (47)†	0·01 (2)	0·03 (6)	0·26 (44)	—	0·09 (16)	0·02 (4
	35–44	0·24 (43)	0·03 (5)	0·03 (5)	0·40 (70)	—	0·15 (27)	0·16 (28
	45–54	0·44 (68)	0·25 (38)	0·15 (23)	0·89 (138)	—	0·48 (74)	1·33 (206
	55–59	0·59 (35)	0·74 (44)	0·35 (21)	1·41 (84)	—	1·39 (83)	5·39 (321
	Total	0·34 (193)	0·16 (89)	0·10 (55)	0·60 (336)	—	0·36 (200)	0·99 (559
Deaths	25–34	0·02 (4)	0·11 (19)	0·01 (1)	—	0·03 (5)	0·05 (8)	0·03 (6
	35–44	0·11 (19)	0·47 (83)	0·05 (8)	—	0·07 (13)	0·06 (11)	0·40 (64
	45–54	0·24 (37)	1·63 (252)	0·02 (3)	—	0·13 (20)	0·34 (53)	1·77 (273
	55–59	0·29 (17)	3·47 (207)	0·08 (5)	—	0·08 (5)	0·84 (50)	3·53 (210
	Total	0·14 (77)	1·00 (561)	0·03 (17)	—	0·08 (43)	0·22 (122)	0·98 (553

*International Statistical Classification Code Nos.

† Actual numbers in brackets

TABLE III

RANKING OF CAUSES OF LABOUR WASTAGE BY TYPE OF DISABILITY

Ill-Health Retirement			Death			Sickness Absence		
Rank	Type	Per-centage	Rank	Type	Per-centage	Rank	Type	Per-centage
1	Circulatory	20	1	Neoplasm	31	1	Respiratory	33
2	Respiratory	17	2	Circulatory	31	2	Digestive	16
3	Mental	12	3	Respiratory	11	3	Locomotor	11
4	Locomotor	10	4	Accidents and violence	8	4	Accidents and violence	7
5	C.N.S.	7	5	C.N.S.	7	5	Skin	6
6	Infective	7	6	Digestive	5	6	C.N.S.	5
7	Digestive	7	7	Infective	4	7	Circulatory	4
8	Neoplasm	4	8	Genito-urinary ..	2	8	Mental	4
9	Accidents and violence	2	9	Allergic, etc.	1	9	Infective	3
10	Allergic, etc.	2	10	Mental	0·1	10	Genito-urinary ..	2
	All other causes ..	12		All other causes ..	—		All other causes ..	9
Total	.. ..	100	Total	.. ..	100	Total	.. ..	100

the major divisions of the International List. Based though they are on rather small numbers in any one age and system group, the trends in the rates agree well with general expectations based on national mortality experience. No direct comparison with national death rates is, however, possible, since our experience does not include deaths occurring after retirement. In general, neoplastic disease, partly for the administrative reasons mentioned above, causes death in service rather than retirement and the death rate does therefore give some indication of its incidence. Circulatory and genito-urinary diseases and accidents and violence excluding suicides are about equally likely to cause retirement or death. All the others are, to a varying degree, more often the cause of retirement.

The results of looking at labour wastage from the differing viewpoints of death, retirement, and sickness rates are shown in Table III where the ten numerically most important classes of disability are ranked in order under each heading. It is apparent that neoplastic diseases, which rank high as a cause of death, are of relatively little importance as causes of retirement or of sickness absence. Diseases of the locomotor system behave quite conversely. Diseases of the respiratory and central nervous system alone have similar ranking in all three types of labour wastage.

Each type of disability thus appears to have a different degree of importance depending upon the index of wastage used. Table IV (overleaf) sets out the relative proportions of the total wastage from either death or ill-health retirement for each of the major diseases within these broad groups. It is clear that a relatively few specific disorders (bronchitis, arterio-sclerotic and hypertensive cardiovascular diseases, psychoneurosis, tuberculosis, arthritis, and peptic ulceration) are the main cause of ill-health retirement. Cancer, coronary disease, accidents and suicides, and cerebro-vascular lesions, on the other hand, are the principal causes of death among the staff of the Post Office.

TES BY DISEASE GROUP (Rates per 1,000 per annum)

Retire	d Deaths							
ulatory ystem 0–468	Respiratory System 470–527	Digestive System 530–587	Genito-urinary System 590–637	Locomotor System 720–749	Accidents and Violence (excluding suicides)	All Other Diseases	Multiple Codings	Total All Causes
02 (4	0·05 (9)	0·06 (10)	0·02 (3)	0·06 (11)	0·02 (4)	0·06 (10)	0·06 (10)	1·02 (176)
16 (2	0·18 (31)	0·15 (27)	0·02 (4)	0·17 (30)	0·03 (6)	0·07 (13)	0·11 (19)	1·75 (308)
33 (206	1·16 (179)	0·54 (83)	0·05 (8)	0·76 (117)	0·16 (24)	0·08 (13)	0·58 (89)	6·86 (1060)
89 (321	4·10 (244)	1·07 (64)	0·22 (13)	2·10 (125)	0·44 (26)	0·42 (25)	2·08 (124)	20·29 (1209)
99 (559	0·82 (463)	0·33 (184)	0·05 (28)	0·50 (283)	0·11 (60)	0·11 (61)	0·43 (242)	4·89 (2,753)
03 (6	0·05 (9)	0·02 (4)	0·01 (1)	—	0·13 (22)	—	—	0·46 (79)
40 (64	0·06 (10)	0·09 (16)	0·01 (2)	—	0·12 (21)	0·01 (1)	—	1·41 (248)
77 (273	0·53 (82)	0·25 (38)	0·16 (24)	0·01 (1)	0·22 (34)	0·02 (3)	—	5·31 (820)
53 (210	1·51 (90)	0·65 (39)	0·12 (7)	—	0·25 (15)	—	—	10·83 (645)
98 (553	0·34 (191)	0·17 (97)	0·06 (34)	0·00 (1)	0·16 (92)	0·01 (4)	—	3·19 (1,792

physical effort. Postmen, and the technicians employed on telephone construction and maintenance work, on the other hand, usually work outside for at least part of the day at tasks which are often physically arduous. The staff can thus be divided into "active" and "sedentary" workers.

Unfortunately, we can make no direct comparison between the death and ill-health retirement rates and the sickness-absence experience of the same population over the same period. We therefore refer, where appropriate, to the more restricted results of a morbidity sample survey conducted among the G.P.O. staff in the London area between mid-1948 and mid-1951. Technicians and technical officers were not included in this sample survey, and the grades of postmen were taken together, but the broad distinction between 'active' and 'sedentary' workers applies well enough for the morbidity data to be useful.

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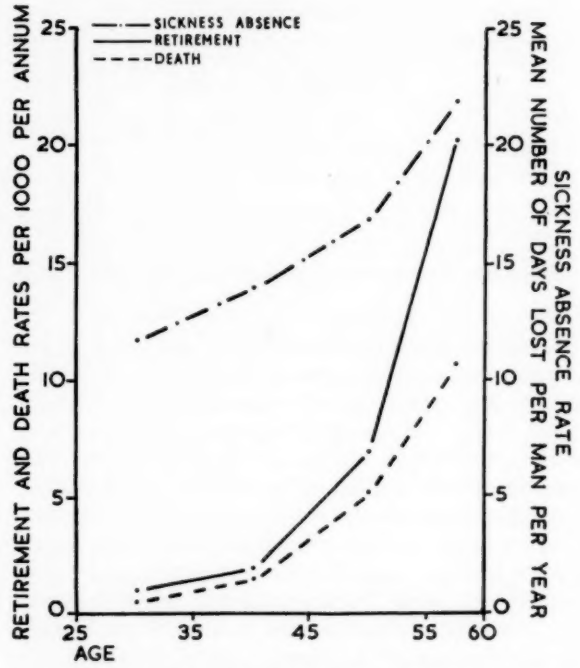

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	35–44	0·24 (43)	0·03 (5)	0·03 (5)	0·40 (70)	—	0·15 (27)	0·16 (28)	0·
	45–54	0·44 (68)	0·25 (38)	0·15 (23)	0·89 (138)	—	0·48 (74)	1·33 (206)	1·
	55–59	0·59 (35)	0·74 (44)	0·35 (21)	1·41 (84)	—	1·39 (83)	5·39 (321)	4·
	Total	0·34 (193)	0·16 (89)	0·10 (55)	0·60 (336)	—	0·36 (200)	0·99 (559)	0·
Deaths	25–34	0·02 (4)	0·11 (19)	0·01 (1)	—	0·03 (5)	0·05 (8)	0·03 (6)	0·
	35–44	0·11 (19)	0·47 (83)	0·05 (8)	—	0·07 (13)	0·06 (11)	0·40 (64)	0·
	45–54	0·24 (37)	1·63 (252)	0·02 (3)	—	0·13 (20)	0·34 (53)	1·77 (273)	0·
	55–59	0·29 (17)	3·47 (207)	0·08 (5)	—	0·08 (5)	0·84 (50)	3·53 (210)	1·
	Total	0·14 (77)	1·00 (561)	0·03 (17)	—	0·08 (43)	0·22 (122)	0·98 (553)	0·

*International Statistical Classification Code Nos. † Actual numbers in brackets

TABLE III

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Ill-Health Retirement			Death			Sickness Absence		
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2	Respiratory	17	2	Circulatory	31	2	Digestive	16
3	Mental	12	3	Respiratory	11	3	Locomotor	11
4	Locomotor	10	4	Accidents and violence	8	4	Accidents and violence	7
5	C.N.S.	7	5	C.N.S...	7	5	Skin	6
6	Infective	7	6	Digestive	5	6	C.N.S...	5
7	Digestive	7	7	Infective	4	7	Circulatory	4
8	Neoplasm	4	8	Genito-urinary ..	2	8	Mental	4
9	Accidents and violence	2	9	Allergic, etc.	1	9	Infective	3
10	Allergic, etc.	2	10	Mental	0·1	10	Genito-urinary ..	2
	All other causes ..	12		All other causes ..	—		All other causes ..	9
Total	.. ..	100	Total	.. ..	100	Total	.. ..	100

the major divisions of the International List. Based though they are on rather small numbers in any one age and system group, the trends in the rates agree well with general expectations based on national mortality experience. No direct comparison with national death rates is, however, possible, since our experience does not include deaths occurring after retirement. In general, neoplastic disease, partly for the administrative reasons mentioned above, causes death in service rather than retirement and the death rate does therefore give some indication of its incidence. Circulatory and genito-urinary diseases and accidents and violence excluding suicides are about equally likely to cause retirement or death. All the others are, to a varying degree, more often the cause of retirement.

The results of looking at labour wastage from the differing viewpoints of death, retirement, and sickness rates are shown in Table III where the ten numerically most important classes of disability are ranked in order under each heading. It is apparent that neoplastic diseases, which rank high as a cause of death, are of relatively little importance as causes of retirement or of sickness absence. Diseases of the locomotor system behave quite conversely. Diseases of the respiratory and central nervous system alone have similar ranking in all three types of labour wastage.

Each type of disability thus appears to have a different degree of importance depending upon the index of wastage used. Table IV (overleaf) sets out the relative proportions of the total wastage from either death or ill-health retirement for each of the major diseases within these broad groups. It is clear that a relatively few specific disorders (bronchitis, arterio-sclerotic and hypertensive cardiovascular diseases, psychoneurosis, tuberculosis, arthritis, and peptic ulceration) are the main cause of ill-health retirement. Cancer, coronary disease, accidents and suicides, and cerebro-vascular lesions, on the other hand, are the principal causes of death among the staff of the Post Office.

TABLE

IREMENTATES BY DISEASE GROUP (Rates per 1,000 per annum)

Retirement and Deaths								
ulatory ystem 0–468	Respiratory System 470–527	Digestive System 530–587	Genito-urinary System 590–637	Locomotor System 720–749	Accidents and Violence (excluding suicides)	All Other Diseases	Multiple Codings	Total All Causes
2 (4)	0·05 (9)	0·06 (10)	0·02 (3)	0·06 (11)	0·02 (4)	0·06 (10)	0·06 (10)	1·02 (176)
6 (28)	0·18 (31)	0·15 (27)	0·02 (4)	0·17 (30)	0·03 (6)	0·07 (13)	0·11 (19)	1·75 (308)
3 (206)	1·16 (179)	0·54 (83)	0·05 (8)	0·76 (117)	0·16 (24)	0·08 (13)	0·58 (89)	6·86 (1060)
9 (321)	4·10 (244)	1·07 (64)	0·22 (13)	2·10 (125)	0·44 (26)	0·42 (25)	2·08 (124)	20·29 (1209)
9 (559)	0·82 (463)	0·33 (184)	0·05 (28)	0·50 (283)	0·11 (60)	0·11 (61)	0·43 (242)	4·89 (2,753)
3 (6)	0·05 (9)	0·02 (4)	0·01 (1)	—	0·13 (22)	—	—	0·46 (79)
0 (64)	0·06 (10)	0·09 (16)	0·01 (2)	—	0·12 (21)	0·01 (1)	—	1·41 (248)
7 (273)	0·53 (82)	0·25 (38)	0·16 (24)	0·01 (1)	0·22 (34)	0·02 (3)	—	5·31 (820)
3 (210)	1·51 (90)	0·65 (39)	0·12 (7)	—	0·25 (15)	—	—	10·83 (645)
8 (553)	0·34 (191)	0·17 (97)	0·06 (34)	0·00 (1)	0·16 (92)	0·01 (4)	—	3·19 (1,792

TABLE IV
SPECIFIC DISORDERS AS CAUSES OF ILL-HEALTH RETIREMENT AND DEATH

Disease Group		Retirements (per cent.)		Deaths (per cent.)	
A. Infective and Parasitic	1. Resp. tuberculosis	6·54	7·33	4·02	4·30
	2. Other tuberculosis	0·47		0·28	
	3. Syphilis	0·07		—	
	4. Poliomyelitis	0·03		—	
	5. Other	0·22		—	
B. Neoplasms	1. Stomach	0·36	3·56	4·52	31·36
	2. Large intestine	0·18		2·06	
	3. Rectum	0·36		1·28	
	4. Primary of bronchus trachea and lung	0·36		3·85	
	5. Lymphatic and haematopoietic	0·22		2·12	
	6. Other	2·07		17·52	
C. Allergic, Endocrine, etc.	1. Asthma	0·91	2·00	0·33	0·95
	2. Diseases of thyroid gland	0·22		0·06	
	3. Diabetes	0·62		0·28	
	4. Other	0·25		0·28	
D. Diseases of Blood etc.			0·25		0·11
E. Mental, Psychoneurotic, etc.	1. Psychosis:		12·20		0·06
	(*a*) Schizophrenia	0·91		—	
	(*b*) Manic depressive	0·54		—	
	(*c*) Paranoid	0·62		—	
	(*d*) Other	1·24		—	
	2. Psychoneurotic:				
	(*a*) Anxiety	2·65		—	
	(*b*) Hysterical	0·15		—	
	(*c*) Neurotic depress.	0·87		—	
	(*d*) Psychoneurosis	2·76		—	
	(*e*) Other	2·47		0·06	
F. Diseases of Nervous System, etc.	1. Vascular lesions	2·51	7·26	6·08	6·81
	2. Inflammatory Disease of C.N.S.	0·87		0·50	
	3. Epilepsy	0·51		—	
	4. Diseases of eye	1·05		—	
	5. Diseases of ear	0·54		0·22	
	6. Others	1·78		—	
G. Circulatory Diseases	1. Rheumatic heart	0·54	20·31	0·89	30·86
	2. Arteriosclerotic heart:				
	(*a*) Coronary arteries	4·98		22·10	
	(*b*) Other	6·03		2·85	
	3. Hypertensive disease:				
	(*a*) With heart disease	1·82		1·28	
	(*b*) Without heart disease	2·91		0·95	
	4. Diseases of arteries	1·78		0·56	
	5. Diseases of veins	1·09		0·61	
	6. Other	1·16		1·62	
H. Respiratory Diseases	1. Influenza	—	16·82	0·89	10·66
	2. Pneumonia	0·04		2·85	
	3. Bronchitis:				
	(*a*) Bronchitis with emphysema	13·59		4·58	
	(*b*) Other	1·74		1·23	
	4. Bronchiectasis	0·69		0·61	
	5. Other	0·76		0·50	
I. Digestive Diseases	1. Ulcer of stomach	1·78	6·68	1·34	5·41
	2. Ulcer of duodenum	3·49		1·40	
	3. Gastrojejunal ulcer	0·11		—	
	4. Hernia	0·11		0·17	
	5. Other	1·20		2·51	
J. Genito-urinary Diseases	1. Nephritis	0·33	1·02	1·56	1·90
	2. Hyperplasia of prostate	0·25		0·11	
	3. Other	0·44		0·22	
K. Skin Diseases	1. Occupational dermatitis	0·11	0·58	—	—
	2. Other	0·47		—	

TABLE IV (*continued*)

Disease Group		Retirements (per cent.)		Deaths (per cent.)	
L. Locomotor System Diseases	1. Arthritis:		10·28		0·06
	(*a*) Rheumatoid and allied	1·38		—	
	(*b*) Osteo-arthritis and allied	3·12		—	
	(*c*) Other	1·71		0·06	
	2. Muscular rheumatism	0·94		—	
	3. Unspecified rheumatism	0·65		—	
	4. Derangement knee joint	0·33		—	
	5. Displacement intervertebral disk	0·87		—	
	6. Flat foot, hallux valgus, etc.	0·62		—	
	7. Other	0·65		—	
Violence	1. Accident	2·18	2·18	5·13	7·48
	2. Suicide	—		2·34	
Ill-Defined, Senile, etc.		0·73		—	
Congenital		0·04		0·06	
Multiple Codings		8·80		—	
Total		100		100	

With the numbers available, any age-specific breakdown by cause and occupation is hardly practicable; but it is possible to compare the rates of invaliding and death in the two occupational groups already labelled as "active" and "sedentary". Table V shows the age-specific death and retirement rates in

TABLE V
ILL-HEALTH RETIREMENTS AND DEATHS AMONG "ACTIVE" AND "SEDENTARY" WORKERS (ALL CAUSES)
(Rates per 1,000 workers per year)

Age Group (yrs)	Workers							
	Sedentary				Active			
	Retirements		Deaths		Retirements		Deaths	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
25–34	57	0·95	34	0·57	119	1·06	45	0·40
35–44	96	1·62	94	1·58	212	1·82	154	1·32
45–54	255	4·82	273	5·16	805	7·93	547	5·39
55–59	215	11·90	181	10·02	994	23·95	464	11·18
Total	623	3·27	582	3·06	2,130	5·73	1,210	3·25

these two groups; it can be seen (as in Fig. 2) that, although the death and retirement rates for "sedentary" workers go up in step both with each other and with the death rate among "active" staff, the retirement rate among the "active" workers diverges rapidly, at ages over 45, from the corresponding "sedentary" rate. To find the reasons for this divergence, we can split up the retirements by cause to see how much of the difference between the total age-standardized retirement rates is due to particular systematic disease groups. The result is shown in Fig. 3, where it is obvious that the most important

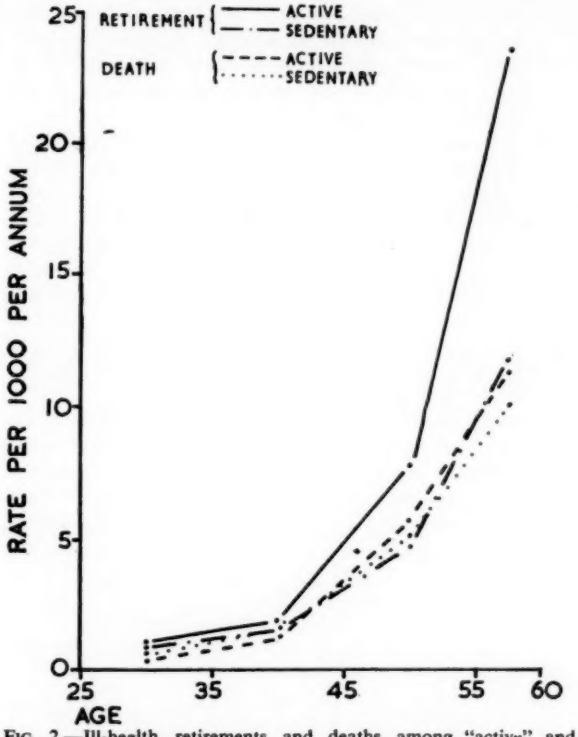

FIG. 2.—Ill-health retirements and deaths among "active" and "sedentary" workers (all causes) per 1,000 per annum, by age.

contributions to the divergence between "active" and "sedentary" workers are made by diseases of the circulatory, respiratory, and locomotor systems. There is little difference, on the other hand, between the invaliding rates from disorders of the central nervous system in the two groups.

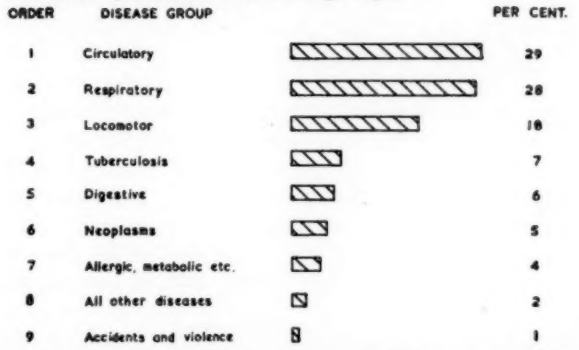

FIG. 3.— Relative importance of causes of differences in invaliding rates between "active" and "sedentary" workers.

Table IV has shown the main components of these groups of diseases and suggests the likely explanation of the disparity in their effect on invaliding in the two types of staff. Within the three disease groups mentioned above, the main specific causes of retirement are arteriosclerotic heart disease, hypertension, bronchitis, and arthritis. All of these cause physical rather than mental disability. Mental illnesses, and diseases of the central nervous system which are largely vascular in origin, seem to be equally common as causes of retirement in the two groups. The reason is not far to seek. A clerk with arteriosclerotic disease of the heart or chronic bronchitis of moderate severity can perform his sedentary duties satisfactorily; but a postman with the same disability cannot climb stairs or cycle up hills with a load of letters and parcels. When, on the other hand, either suffers a severe cerebrovascular haemorrhage, the clerk is just as much incapacitated as the postman and the retirement rates from this cause are much the same in these two occupations.

Table VI shows the difference in the age-specific sickness absence rates found in the sample survey for postmen, who form the bulk of the more active "outdoor" group, and other men employed mainly on sedentary duties. The disparity between these two sets of rates can be expressed as an active: sedentary ratio and contrasted, as in Fig. 4, with similar ratios

TABLE VI

AGE-SPECIFIC SICKNESS ABSENCE RATES IN POSTMEN AND OTHERS
(Mean number of days lost per man per annum)

Age Group (yrs)	Postmen (Active)	Others (Sedentary)	Active: Sedentary Ratio
25–34	13·7	9·4	1·46
35–44	15·7	11·6	1·35
45–54	18·7	13·3	1·41
55–59	25·1	16·7	1·50

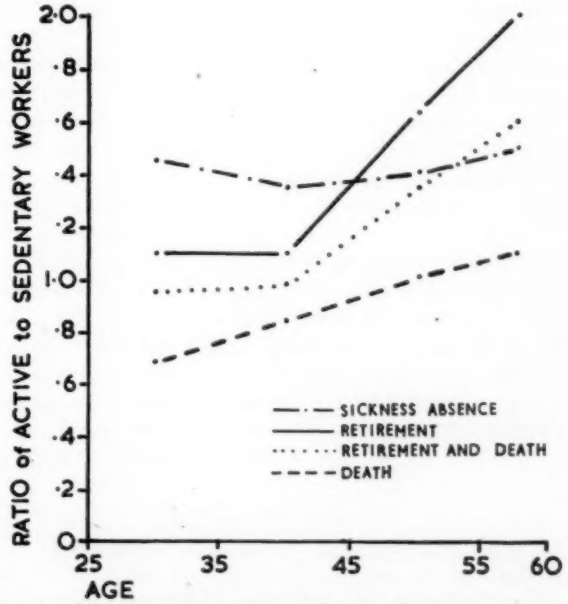

FIG. 4.— Ratio of sickness absence, ill-health retirements, and death rates in "active" and "sedentary" workers, by age.

for ill-health retirement and death, either separately or together.

Although sickness absenteeism is consistently higher among the physically "active" staff at all ages, the measure of the relative incidence of serious disease given by the combined death and retirement rate confirms that there is a 50 per cent. excess in occupational disability due to disease or injury among the older "active" workers.

Summary

A survey has been made of the causes both of retirement due to ill-health and of death before retirement at 60 years of age among the male established staff of the General Post Office during the period 1949 to 1952 inclusive. Where appropriate, the rates of invaliding and death have been compared with the results of a sample survey of sickness absence conducted among certain groups of G.P.O. staff in the London area during the period mid-1948 to mid-1951. The analysis of the data suggests that:

(1) The age-specific rates for sickness absence, ill-health retirement, and death rise appreciably after the age of 45. Of the three, the retirement rate appears to be the most sensitive indicator of the effect of ageing on the incidence of occupationally disabling injury or disease.

(2) At current rates, some 27 per cent. of Post Office employees aged 25 (a selected group with death rates usually below those of the general population) may be dead or chronically incapacitated before they reach the age of 60.

(3) The apparent relative numerical importance of different groups of disorders depends on the index of labour wastage used; but the respiratory diseases rank high as a cause of absence, invaliding, and death. Neoplasms and coronary disease of the heart, on the other hand, usually appear as causes of death rather than as major causes of sickness absence or premature retirement. A detailed account is given of the proportionate contributions made by particular disorders to the total wastage by death and ill-health retirement.

(4) A comparison of the death and retirement rates among two groups of workers whose jobs make different physical demands, shows that the gross disparity between them in ill-health retirement is due to excessive rates for diseases of the respiratory, cardiovascular, and locomotor systems among the older manual workers. Occupational disability as measured by sickness absence and total ill-health retirement and death rates appears to be 50 per cent. higher among the older "active" workers between 45 and 60 years of age.

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PREMATURITY AND PAID WORK DURING PREGNANCY

BY

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Most enquiries into the causes of prematurity conclude that at least 50 per cent. of cases cannot be explained on medical grounds (Joint Committee of the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association, 1949; Baird, 1953). In these cases pregnancy is clinically normal but nevertheless labour starts before the expected date, or, if the baby is born at term, it weighs 5½ lb. or less. In such circumstances poor maternal health and physique, inadequate diet, and overwork or worry may be involved.

These influences are difficult to measure, and since several may operate together the effect of each cannot be easily disentangled. For example, hard physical work might have no ill effect on a healthy well-fed woman but might bring on premature labour in one who is under-nourished or unhealthy. Again it seems possible that paid work accompanied by heavy domestic responsibilities or anxieties over money or housing might cause more harm than the same amount of work done under happier conditions. Light work in an office, shop, or factory may not involve as much strain as housework and, if there is little domestic responsibility, may be more a relaxation than a task.

Various investigators have shown, however, that the prematurity rate increases with the length of time worked during pregnancy (Royal College of Obstetricians and Gynaecologists, 1948; Douglas, 1950; Ferguson and Logan, 1953). Our preliminary investigations pointed in the same direction. Table I shows that in Aberdeen in each social class married primiparae who worked beyond the 20th week of pregnancy had a higher rate of prematurity than those who stopped earlier. Social classification is based on the husband's occupation (General Register Office, 1951).

TABLE 1

INCIDENCE (PER CENT.) OF PREMATURITY ACCORDING TO PERIOD OF WORK DURING PREGNANCY

Social Class	Weeks Worked		Total
	Under 21	21 or more	
I, II	3·6 (83)	10·0 (20)	4·9 (103)
III	4·4 (181)	13·9 (72)	7·1 (253)
IV, V	7·6 (119)	10·6 (94)	8·9 (213)

Numbers of cases are given in brackets.

It cannot, however, be inferred from this association that there is a *causal* relationship between the duration of paid work and prematurity. Women who work during pregnancy may do so because they need money, and their living standards and standards of health may be low. These circumstances, rather than the work itself, may be the cause of prematurity. Indeed, paid work might be beneficial, since the money earned could be used to improve living standards.

The problems of mothers with several children are very different from those of primigravidae. They have a more settled home background, and, although they do not usually undertake full-time employment outside the home, have heavy household duties which impose a greater physical and mental strain than most outside work. Fortunately, the physiological processes of reproduction are usually at their most efficient during the second, third, and fourth pregnancies, and this fact, rather than less work, paid or unpaid, probably explains why, in Aberdeen, multigravidae were found to have a lower incidence of prematurity than primigravidae.

In this inquiry, a group of primigravidae where pregnancy ended in the birth of a baby weighing 5½ lb. or less was compared with a matched control group where the babies weighed 6½ lb. to 8½ lb. If duration of paid work during pregnancy were a causal influence in prematurity, the former group should contain more women who worked late in pregnancy than the latter.

PLAN OF THE ENQUIRY

1. POPULATION STUDIED.—It was decided to limit the inquiry to 1,750 legitimate single births to primiparae resident in the city of Aberdeen and delivered in the Aberdeen Maternity Hospital as booked cases during

1952 and 1953. These constituted 90 per cent. of all legitimate first births in the city during the 2 years and provided for study 136 babies weighing 5½ lb. or less.

It was decided to omit from further consideration 27 cases in which there was an obvious clinical explanation of the prematurity. These omissions comprised:

Seventeen cases where labour had been induced by rupture of the membranes before the 39th week of pregnancy;

Five in which the foetus was seriously deformed;

Five in which the mother suffered from a chronic disease incidental to the pregnancy but likely to be the cause of the prematurity.

Thus 109 cases of prematurity remained for study; in these, the mothers did not suffer from serious incidental disease, the babies had no serious deformity, and labour began spontaneously or pregnancy was allowed to continue until at least the 39th week.

In order to increase the contrast between the premature and non-premature groups, 373 cases in which the babies weighed between 5½ and 6½ lb. were excluded from the controls; 136 babies over 8½ lb. were also omitted because excessive birth weight may be associated with abnormality in the mother or child, *e.g.* diabetes. Fourteen cases showing abnormalities similar to those in the 27 omitted cases of prematurity were also excluded from the controls. Thus 1,091 out of the 1,614 cases in which the baby weighed more than 5½ lb. were available for selection of the matched controls.

2. MATCHING PROCEDURE.—In inquiries which relate medical phenomena to social conditions it is usual to analyse the results for each social class separately so that the effect of any special influence, *e.g.* work, can be studied in the context of broadly similar social conditions. Since no known method of classification can produce groups with homogeneous social and economic characteristics this method is rather crude.

An analysis of data for the married primiparae resident in Aberdeen who were booked at the maternity hospital showed that women in the poorer social classes, women of short stature, and women aged 15–19 at the time of delivery were more likely to work during the second half of pregnancy. Many patients who worked late in pregnancy had conceived before marriage, and thus had an incentive to continue earning money to meet the costs of marriage and parenthood. On the other hand they had few domestic responsibilities during early pregnancy, and being unable to find independent accommodation after marriage, the majority lived with their husbands as boarders in the parental home. Where pregnancy occurs before marriage, women tend to postpone their first visit to the antenatal clinic until after marriage and thus as a group they have less antenatal care than usual. Social class, growth, duration of marriage, age at delivery, work during pregnancy, housing conditions, and antenatal attendance at clinics are all inter-related. Social classification by itself does not sufficiently control all the variables other than work in pregnancy which it is desired to eliminate from consideration.

In selecting the control group it was decided to match for social class, height, age, timing of marriage, and type of work done during or before pregnancy. Whilst prematurity might also be affected by the duration of antenatal care and by the physical strain imposed by different types of housing conditions and domestic responsibilities, the groups were not matched in those two respects as it was considered that groups matched in the way already mentioned would have very similar antenatal care and housing conditions. The date at which women stopped work, which was obtained from independent sources, was not known at the time of matching.

The matching criteria were classified as follows:

Husband's Social Class	I, II; III; IV, V.
Wife's Main Occupation	Professional and technical; clerical; shop assistant; skilled manual; semi-skilled and unskilled manual.
Age at Delivery	15–19; 20–29; 30 and over.
Height	Under 5ft. 1in.; 5ft. 1in.–5ft. 3in; 5ft. 4in. and over.
Timing of Marriage	Pre-marital conception; post-marital conception.

For each premature case one control was chosen of the same social class and occupational group, and the same age, height, and marriage/conception group. There was usually a choice of controls, and the case with the nearest hospital admission number was selected.

When the date of stopping work came to be determined, it was found that out of the 109 prematures and their controls information was not available for three premature and two control cases and these were rejected together with their opposite numbers. The week of pregnancy at which the women stopped work was then calculated from the beginning of the last menstrual period, as established by the senior medical staff of the Aberdeen Maternity Hospital during their routine care of the patients. One premature case was rejected together with its control, as the date of the last menstrual period could not be estimated sufficiently accurately, thus leaving a total of 103 premature and 103 control cases.

RESULTS

If prolonged work during pregnancy were a cause of prematurity we would expect to find that more premature cases than controls worked to a late stage of pregnancy. As will be seen from Table II the two groups were closely similar in the duration of work.

As already stated, cases of serious abnormality of pregnancy leading to early obstetrical intervention, and cases of serious foetal and maternal abnormality, were excluded, but the premature group still contained a number of cases where pregnancy was complicated by such clinical abnormalities as pyelitis, threatened abortion, ante-partum haemorrhage, or pre-eclampsia. Some of these abnormalities might have been responsible for the occurrence of prematurity, and they might also have caused the patient to stop work. These cases were therefore separated out, leaving a group of 64 cases in which, apart from the birth of a premature baby, the course

of pregnancy was uneventful. The analysis was repeated using this group of "normal pregnancies". Some of the matched controls for this group were not clinically normal since the matching procedure had not taken clinical phenomena into consideration, and one might therefore expect to find a shorter duration of work in the control cases; but as shown in Table II there is very little difference between the groups.

TABLE II

DURATION OF WORK IN PREMATURE AND CONTROL GROUPS

Group			Week of Pregnancy in which Work Ceased			
			0–20	21–26	27+	Total
Total Cases Examined	All Cases	Premature..	65	12	26	103
		Control ..	69	10	24	103
		Total ..	134	22	50	206
	Normal Pregnancies Only	Premature..	39	9	16	64
		Control ..	42	7	15	64
		Total ..	81	16	31	128
Manual Workers and Shop Assistants Only	All Cases	Premature..	53	12	17	82
		Control ..	57	8	17	82
		Total ..	110	20	34	164
	Normal Pregnancies Only	Premature..	32	9	9	50
		Control ..	32	6	12	50
		Total ..	64	15	21	100

Since manual work might impose a greater strain than non-manual work, and might hence be deleterious, the analysis was repeated for shop assistants and manual workers only. Again there was no difference in the duration of work between the premature and control groups.

As already stated the premature and control groups were not matched for duration of antenatal care or for housing conditions. While the investigation was not primarily concerned with these matters, the two groups were in fact almost identical in respect of the stage of pregnancy at which patients first reported to the antenatal clinic. Data taken from the Almoners' records showed that 60 per cent. of the premature group had modern conveniences at home (fixed bath, piped hot water, and inside W.C.) compared with 53 per cent. of the control group. The domestic responsibilities of each woman are noted routinely by the Almoners and classified according to whether the patient has full or partial responsibility for the management of her home, or whether she and her husband are boarding with another family. The numbers with partial responsibility were equal in each group, but the premature group contained more women with full responsibility (33 against 25 in the control group) and fewer women who were boarding (30 against 38). Further inspection showed that the women with full domestic responsibility in the premature group gave up work at an earlier stage than women with full responsibility in the control group. If the greater domestic responsibility is set against the shorter duration of outside work, then there is probably no substantial difference between the two groups in the total work output.

CONCLUSION

This investigation is based on a small number of cases, but the similar duration of work in the premature and control groups is striking and repeats itself consistently for sub-groups such as manual workers, or women with clinically normal pregnancies where the closest association between duration of work and "unexplained" prematurity might be expected. Though women who work until a late stage of pregnancy are more likely to have premature babies, there is no evidence that increased length of work, by itself, predisposes to prematurity. The amount of antenatal care and of domestic responsibility and the nature of housing conditions also seem to have little direct effect on prematurity rates.

Yet the social gradient in the incidence of prematurity is pronounced, and has been widely reported. This probably arises because living conditions which produce well-grown and healthy mothers lead also to a low prematurity rate (Baird, 1953; Baird and Illsley, 1953). "A healthy way of life" is composed of many different influences. Thus, it is probably unrealistic to expect any single social factor, such as paid work during pregnancy, housing conditions, or antenatal care, to exercise a predominant influence on prematurity. The type of mother is more important than the conditions under which her pregnancy is carried through.

The limitations of this study must be stressed. It does not show that the amount of physical strain experienced by the individual mother during pregnancy is unimportant; nor does it show whether type or duration of work has any influence on the production of abnormalities of pregnancy, which in turn may give rise to prematurity.

The results of this investigation do not in any way impair the clinical principle that the patient who appears to be suffering from physical strain should rest; but they do suggest that further social measures designed to reduce the duration of paid work undertaken by primigravidae would do little to lower the incidence of prematurity.

SUMMARY

(1) 103 primiparae who gave birth to premature babies (birth weight 5½ lb. or less) were compared with 103 matched primiparae whose babies weighed 6½–8½ lb. Cases in each group were matched in pairs for a number of factors known to be associated with prematurity or with duration of work in pregnancy, namely: husband's social class; wife's occupation; age at delivery; maternal height; whether conception was pre-marital or post-marital.

(2) When the groups were matched thus, they showed little or no difference in average duration of antenatal care, in housing conditions, or in domestic responsibility.

(3) No difference was found between the groups in respect of duration of paid work during pregnancy. This held good when cases of clinically normal pregnancy were considered separately; it was also true for women who were manual workers and shop assistants.

We are grateful for advice and criticism to Professor D. Baird, Department of Midwifery, Aberdeen, and Dr. J. N. Morris and Mr. J. A. Heady of the Social Medicine Research Unit, Medical Research Council.

REFERENCES

Baird, D. (1953). *Proc roy. Soc. Med.*, **46**, 877.
—— and Illsley, R. (1953). *Ibid.*, **46**, 53.
Douglas, J. W. B. (1950). *J. Obstet. Gynaec. Brit. Emp.*, **57**, 143.
Ferguson, T., and Logan, J. C. (1953). *Glasg. med. J.*, **34**, 221.
General Register Office. (1951). "Classification of Occupations, 1950". H.M.S.O., London.
Joint Committee of the Royal College of Obstetricians and Gynaecologists and the British Paediatric Association (1949). "Neonatal Mortality and Morbidity". Ministry of Health. Reports on Public Health and Medical Subjects, No. 94. H.M.S.O., London.
Royal College of Obstetricians and Gynaecologists and Population Investigation Committee (1948). "Maternity in Great Britain". Oxford University Press, London.

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CURRENT DIFFERENTIAL INFANTILE MORTALITY
ENGLAND AND WALES

BY

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A recent publication (Taylor, 1954) reviewed the decline of infantile mortality in England and Wales during the past half-century from a diagnostic viewpoint in as far as it is possible to do so by recourse to official sources. The outcome was a strong presumption in favour of the view that there is no likelihood of stabilization at the present level, since the tempo of decline is still steep. One might be more confident about the long-range prospect if it were possible to speak with greater assurance about the local distribution of high rates, to what extent areas with high rates share common social characteristics, to what extent it is true that such areas have always had a high level of infant mortality, and to what extent inordinately high local infant death rates are associated with a single or few causes.

Official sources unfortunately supply too meagre data to answer these questions fully, even if we supplement information issued from the office of the Registrar-General with what we can learn from annual reports of Medical Officers of Health; and a deeper understanding of the present situation must await extensive *ad hoc* enquiries. Meanwhile, it may be useful to summarize what relevant figures are to hand as an indication for fruitful investigation in the field, more especially because the ONE per cent. sample of the 1951 Census supplies for the first time in 20 years a conspectus of the social characteristics of certain local areas. On that account the local unit of what follows is the population under the administration of a County Council.

The accompanying maps (Figs 1 and 2, overleaf) show that a high level of infantile mortality in 1935 was mainly located in the north and west. In 1952 the northerly concentration is less striking but in the west the infant death rate is still high. The history of localities with conspicuously high or conspicuously low rates as set forth in Table I discloses some striking regularities. That the absolute range has dropped from 77 (Dorset, 100; Lancashire, 177) in the quinquennium 1891–95 to 23 (Herts and East Sussex, 20; Montgomery and Westmorland, 43) in 1950, tells only part of the story. If *h* and *l* stand for the highest and lowest rates referable to local units of

TABLE I

EXTREMES OF INFANT MORTALITY, 1876–1950, IN COUNTIES AND LARGE TOWNS

Year ..	1876–80	1891–95	1901–05	1910	1936	1950
Highest Rates	Leicestershire 169 Lancashire 165	Lancashire 177 Glamorgan 173 Staffordshire 168 Leicestershire 167	Lancashire 161 Glamorgan 158 Durham 158	Carmarthen 136 Lancashire 129 Durham 128 Glamorgan 126	Durham 71 Northumberland 70 Staffordshire 67 Denbigh 67 Caernarvon 66 Carmarthen 65 Glamorgan 63 West Riding Yorkshire 63	Montgomery 43 Westmorland 43 Durham 40 Glamorgan 39 Monmouth 39 Northumberland 36
Lowest Rates	Wiltshire 108 Westmorland 107 Cardigan 99	Westmorland 109 Wiltshire 103 Dorset 100	Dorset 92 Hertfordshire 92 Wiltshire 91	Wiltshire 69 Oxford 67 Hertfordshire 63	Hertfordshire 38 East Sussex 37 Cambridge 37 Wiltshire 36	Wiltshire 23 Essex 23 Surrey 22 Middlesex 22 Cambridge 21 Oxford 21 Peterborough (Soke of) 20 East Sussex 20 Hertfordshire 20
Range	70	77	70	73	35	23
Per cent. of Mean Range ..	52	56	56	73	65	73

*Holder of a Research Fellowship from the Rockefeller Foundation

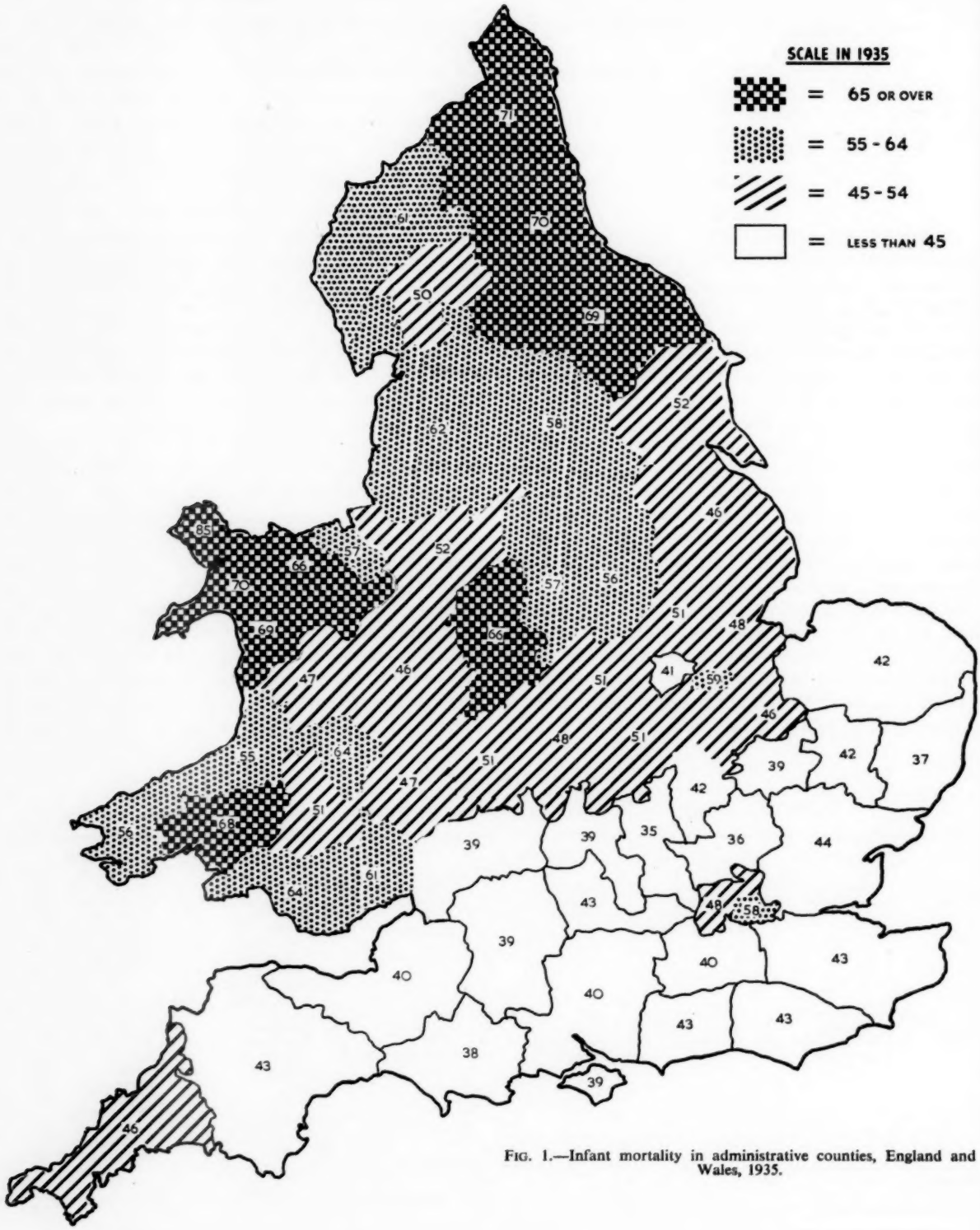

FIG. 1.—Infant mortality in administrative counties, England and Wales, 1935.

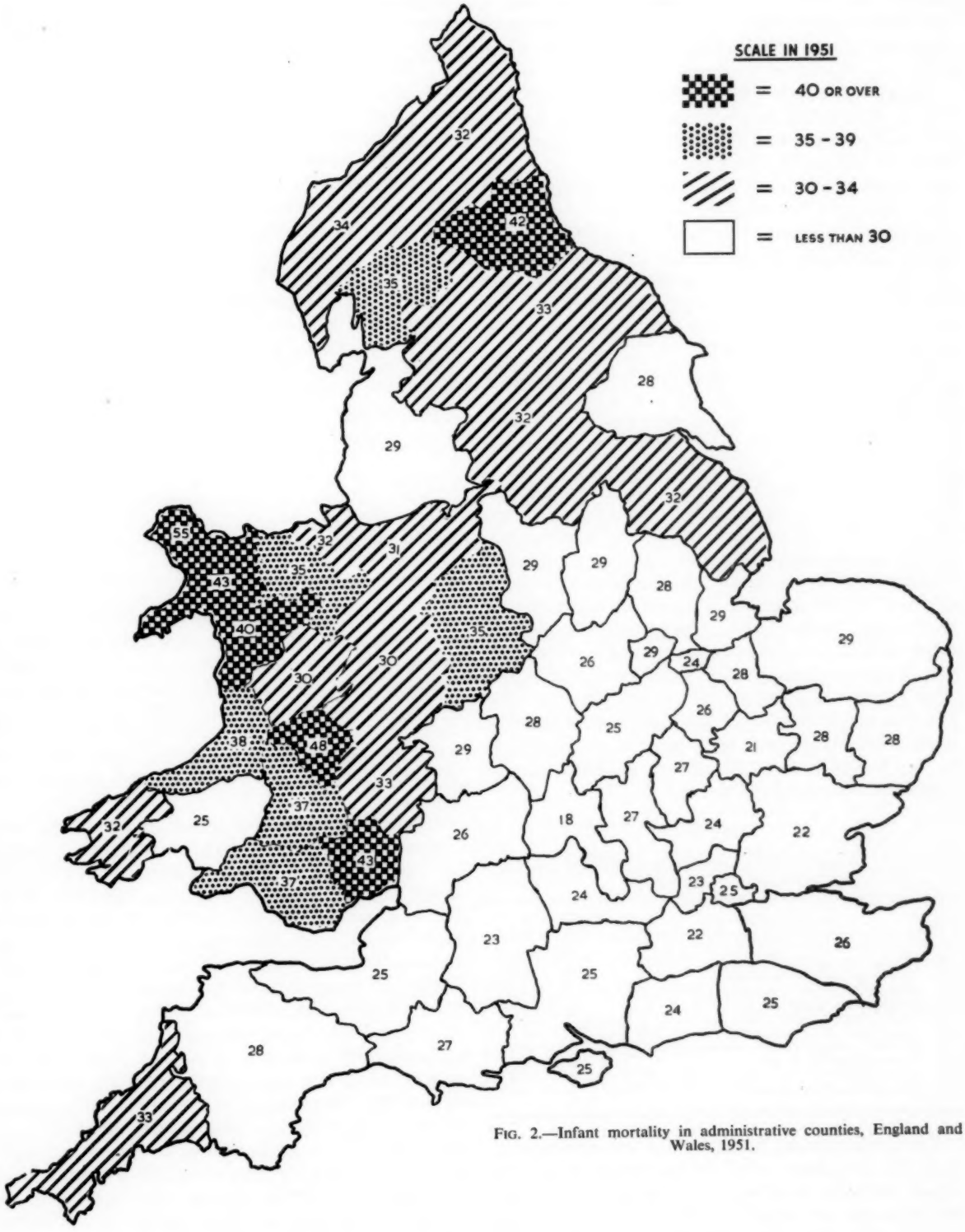

FIG. 2.—Infant mortality in administrative counties, England and Wales, 1951.

population in a given year or quinquennium, we may specify the range as a percentage of the mean, *i.e.* $100(h - l) \div \frac{1}{2}(h + l)$; and this has increased from 56 in the quinquennium 1891–95 to 73 in 1950.

Broadly, the data disclosed by Table I point to a high concentration in mining and quarrying regions and a low concentration in residential areas; but there are anomalies which provoke inquiry and defy any simple explanation in the light of data available. Thus Wiltshire has retained over half a century its place among population units with a very low level of infant death, but its population (392,400 in 1951) and the annual number of births (about 6,000 per annum at this time) are so small as to encourage the expectation that the infant death rate would be subject to wide fluctuations.

We may probe a little more deeply into the nature of these differences if we use a selected group of counties (*Appendix*) to which we can assign a current figure supplied by the 1951 Census for percentage of males employed in various occupations. Table II shows product-moment correlation coefficients referable to such percentages and to the infant death rate of the listed local units. The occupational picture which emerges indicates a striking association of high mortality with a high proportion of males engaged in mining or quarrying and of low mortality with a high proportion of black-coated or agricultural workers. Against the fact that a high proportion of persons engaged in personal services also goes with a low infant death rate, we should of course give due weight to the fact that such a concentration of individuals signifies a large body of residents able to pay for such services, whence a comparatively high level of material prosperity.

TABLE II

CORRELATION BETWEEN INFANT MORTALITY AND PERCENTAGE OF EMPLOYEES IN EACH OCCUPATIONAL GROUP, BY COUNTIES

Occupational Group (Standard Industrial Classification in brackets)	r
1. Mining and Quarrying (III)	·724
2. *Unskilled Occupations* (*XXVI*)	·459
3. Metal Manufacture and Engineering (VI)	·153
4. Building and Contracting (XIV)	·086
5. Textile Manufacture (VII)	·061
6. *Agriculture, Horticulture and Forestry* (*II*)	−·078
7. Professional and Technical Occupations (XIX)	−·471
8. Personal Service (XXII)	−·552
9. Administration, Directors, Managers (XVI)	−·566
10. Commerce, Finance, and Insurance (XVIII)	−·597

That overcrowded homes and a low standard of parental education may be contributory to the higher infantile mortality rates invites us to invoke the technique of partial correlation. As a criterion of parents' educational standard, we employ the proportion of persons leaving full-time schooling before the age of 15. Several indices of overcrowding may be computed from the 1951 Census data, *inter alia:*

(*a*) households per dwelling;
(*b*) rooms per household;
(*c*) persons per dwelling;
(*d*) persons per room;
(*e*) percentage households in unshared dwellings.

None of these is entirely satisfactory for our purpose, since size of room, number of rooms, and age-sex structure of the household are all relevant to a proper criterion of overcrowding. However, Charles (1951) noted that "in the City of Birmingham a very high proportion of babies were born to households with two or more persons per room", and "in a check survey on a very small randomly selected sample of households the standardized neonatal mortality rate rose according to degree of overcrowding". Thus she calculates:

Persons per Room	Standardized Neonatal Mortality Ratio
Less than 1	15·8
1 and less than 1·5	16·0
1·5 and less than 2	17·2
2 or more	18·3

Accordingly, we have calculated the zero-order correlation between infant mortality and persons per room in shared dwellings as $r_{mh} = 0{\cdot}536$, which is very highly significant. It is known that a very high proportion of children are born into families sharing dwellings, so that this correlation is probably of high value as providing evidence that a major proportion of infant loss may be associated with overcrowded homes.

Table III (opposite) summarizes all we can infer concerning the interrelations of infantile mortality (m), percentage of males engaged in mining and quarrying (q), defective education specified above (e), and the foregoing criterion of overcrowding (h). The zero-order correlations, r_{mq}, r_{me}, and r_{mh}, between m and q, m and e, and m and h, are all high; but so are those (r_{qh} and r_{qe}) between q and h or e. First-order partial coefficients other than $r_{mh.q}$ and $r_{mh.e}$ are fairly high, especially $r_{mq.h}$; the highest second-order coefficient is $r_{mq.he}$. From this we may conclude that high infantile mortality associated with a high percentage of males employed in mining or quarrying is by no means largely attributable to the separate or joint effects of prevalent overcrowding, or of a low educational level characteristic of regions in which mining and quarrying are dominant occupations. Our sources do not permit us to explore the relevance of the wage level. Apart

TABLE III

ZERO, FIRST, AND SECOND ORDER CORRELATION

Zero-Order Correlation	Significance ($n = 36$)	First-Order Correlation	Significance ($n = 36$)	Second-Order Correlation	Significance ($n = 36$)
r_{mq} ·7244	**	$r_{mq.h}$ ·5822	**	$r_{mq.he}$ ·4776	**
r_{mh} ·5359	**	$r_{mq.e}$ ·0920	**	$r_{mh.qe}$ ·0038	None
r_{me} ·6326	**	$r_{mh.q}$ ·4930	None	$r_{hq.me}$ ·3708	*
r_{hq} ·6752	**	$r_{hq.m}$ ·2216	**	$r_{me.hq}$ ·2562	None
r_{he} ·6382	**	$r_{mh.e}$ ·4471	None	$r_{he.mq}$ ·3148	Doubtful
r_{qe} ·6853	**	$r_{me.h}$ ·4576	**	$r_{qe.mh}$ ·2581	None
		$r_{he.m}$ ·2712	**		
		$r_{me.q}$ ·4252	None		
		$r_{qe.m}$ ·4241	*		
		$r_{hq.e}$ ·3267	*		
		$r_{he.q}$ ·4479	Doubtful		
		$r_{qe.h}$	**		

m = infantile mortality
q = percentage adult males employed in mining and quarrying
h = overcrowding
e = deficient education
** = highly significant ($P<0{\cdot}01$)
* = significant ($P<0{\cdot}05$)

from the conclusion last stated, all that we can conclude by recourse to the new data made available from the 1951 Census ONE per cent. sample is that:

(*a*) Regional black-spots of infant mortality cannot be ascribed to a climate of locational causes.

(*b*) They are highly associated with the occupation of the males resident in these areas.

(*c*) The worst areas are of long-standing character.

(*d*) A poverty syndrome as depicted by Woolf and Waterhouse (1945) may still play a part.

It might be possible to learn more of the agencies contributing to the present tempo of decline, and hence to make short-term forecasts with some assurance, if all county medical health reports cited a diagnostic breakdown of infant deaths, comparable to what is available for the country *as a whole* through the annual reviews of the Registrar-General.* Unfortunately, reports which do this are mostly referable to localities in which the rates are low, and an examination of material available seems to show that good records are available only for population units which have least need to profit from them. We can anticipate little further enlightenment without recourse to field enquiries on a costly scale.

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REFERENCES

Charles, E. (1951). *British Journal of Social Medicine*, **5**, 41.
Taylor, W. (1954). *British Journal of Social and Preventive Medicine*, **8**, 1.
Woolf, B., and Waterhouse, J. (1945). *J. Hyg.* (*Lond.*), **44**, 67.

* The county tables in the Registrar-General's reviews are *not* adequate for this purpose.

APPENDIX

Administrative County Areas used in Text

Bedfordshire
Berkshire
Buckinghamshire
Cheshire
Cornwall
Derbyshire
Devonshire
Dorset
Durham
Glamorganshire
Gloucestershire
Hertfordshire
Leicestershire
Lincolnshire (Lindsey)
Monmouthshire
Norfolk
Northamptonshire
Northumberland
Nottinghamshire
Shropshire
Somerset
Southampton
Staffordshire
Sussex East
Sussex West
Warwickshire
Wiltshire
Worcestershire
Yorkshire (North Riding)
Essex
Kent
Lancashire
London
Middlesex
Surrey
Yorkshire (West Riding)

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A SURVEY OF MENTAL HOSPITALS AND MENTAL DEFICIENCY INSTITUTIONS IN THE BIRMINGHAM REGION

II. MENTAL DEFICIENCY INSTITUTIONS

BY

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1. INTRODUCTION

The necessity of providing adequate care for mental defectives undoubtedly ranks amongst the most urgent problems confronting the hospital services. It has much in common with that of appropriate provision for the chronic-aged and the insane, but, whereas such patients present problems of humane hotel-keeping in institutions already deemed to be hospitals before the Act, the mental defective colony became a "hospital" by the mere circumstance of allocation to a Regional Hospital Board.

As a preliminary to an examination of the problem in the Birmingham Region, it is pertinent to consider the disposal of an individual with low I.Q. in general terms. The mental defective, as Tredgold (1947) points out, represents a band at one end of a spectrum of teachability extending from the expected university entrant, the bulk of pupils attending grammar schools and secondary modern schools, those attending or resident in special schools or occupation centres for the educationally sub-normal, and those resident in mental defective institutions. Provision is also made for dull and backward children with I.Q.s in the range 80–85 (roughly) by means of special classes in ordinary schools. We are here concerned with individuals with I.Q.s below 70, *viz:* the feeble-minded individual of I.Q. between 50 and 69, the imbecile of I.Q. between 20 and 49, and the idiot of I.Q. less than 20.

Our problem at this stage is, if possible, to establish a criterion for assessing whether or not an individual requires admission to an institution. We may first recall the point made by Penrose (1949):

> . . . The cases requiring care and supervision in a hospital, which supplies nursing and training facilities, are those which have the most urgent claims for admission. The idiots need attention on account of their helplessness and the feeble-minded need supervision on account of their propensities for maladjustment in the community. Between these classes is a group, mainly composed of imbeciles, who are too low grade to be problems in the community and yet are capable of looking after themselves to some extent in the sheltered environments of their own homes, the homes of foster parents or guardians, public assistance institutions, or general hospitals.
>
> The elaborate and sometimes illogical methods by which patients reach training schools and institutions tend to prevent the inmates from forming a homogeneous group. A few cases are placed privately and, for some, training is provided under charities; most of these cases are severely affected. Those placed in residential special schools, under the Education Acts, are mild cases of intellectual defect, as are also those who come under supervision by reason of court proceedings under the Children Act or other Acts or in consequence of their infringement of criminal law. The most usual method of placing, however, *i.e.* through magistrate's order under the Mental Deficiency Acts, is used for all grades and types. From the point of view of practical administration these alternative methods of procedure are useful, although, in a biological analysis of the phenomena of defect, they are disturbing factors which merely add to the natural difficulties of investigation . . .

If we accept this review of the situation, it is apparent that only those individuals classified as idiots would be referred for admission if I.Q. were the sole criterion for admission. As regards individuals of higher I.Q., the special schools and occupation centres remain as alternatives to admission to the mental defective institution. An examination has been made to ascertain the range of I.Q. of individuals attending these schools and centres. Table I gives the results of analysing children attending the special schools in Birmingham with respect to sex, age, and I.Q. It will be noted that the special school caters for a range extending to an I.Q. as low as 40, even if we ignore the few cases with I.Q.s of less than this value. In fact the bulk of these children (70 per cent.) have I.Q.s within the range corresponding to the feeble-minded class.

A similar analysis of 61 children attending occupation centres revealed that a large proportion (62 per cent.) were untestable, and of the remainder 50 per cent. had I.Q.s of less than 40, 32 per cent. had

TABLE I

ANALYSIS OF CHILDREN ATTENDING OR RESIDENT IN SPECIAL SCHOOLS BY AGE, SEX, AND INTELLIGENCE QUOTIENT

Age Group (yrs)	Sex	Intelligence Quotient							
		Under 40	40-49	50-59	60-69	70-79	80 and over	Untestable	Totals
Under 5	M	—	—	1	—	1	—	—	2
	F	—	—	—	—	—	—	—	—
5–9	M	—	11	37	46	43	3	3	143
	F	—	9	35	37	12	—	4	97
10–15	M	1	6	85	235	167	9	4	507
	F	—	8	86	157	60	2	2	315
All Ages	M	1	17	123	281	211	12	7	652
	F	—	17	121	194	72	2	6	412

I.Q.s of between 40 and 49, and only 18 per cent. had I.Q.s of 50 and over.

These findings endorse the view implicit in Penrose's statement that individuals who may be classed as feeble-minded persons or imbeciles do not require institutional care solely on account of low intelligence. The possibility of establishing a medical criterion relevant to whether a child will go to a special school, occupation centre, or mental deficiency institution also invites preliminary consideration; Table II shows the results of an analysis of children attending or resident in the first two. A diversity of medical conditions associated with mental defect is there apparent; and it is clear from these findings that the presence of one or other does not in itself constitute a sufficient reason for admission to a colony. We must therefore conclude that the disposal of an individual with low I.Q. depends primarily on social status, facilities for home care, and locality. In other words, we must recognize at the outset that the status of the colony within the framework of the regional hospital set-up derives its sanction from legal and social considerations which have little to do with medicine.

TABLE II

ANALYSIS OF CHILDREN ATTENDING OR RESIDENT IN SPECIAL SCHOOLS AND OCCUPATION CENTRES BY DIAGNOSIS

Diagnostic Category	Special Schools		Occupation Centres*	
	No.	Per cent. of all Cases	No.	Per cent. of all Cases
Organic Disorders of C.N.S. ..	19	1·8	6	9·8
Epilepsy	22	2·1	7	11·5
"Fits"—unspecified	30	2·8	5	8·2
Congenital Malformations ..	20	1·9	9	14·8
Mongolism	9	0·8	11	18·0
Microcephalus	11	1·0	6	9·8
Hydrocephalus	4	0·4	1	1·6
Cretinism	4	0·4	—	—

* Only those cases attending for the first time in a recent six-monthly period were surveyed.

2. AIMS OF THE SURVEY

An indication of the present demand for beds in the mental deficiency institutions of the Birmingham Region is given by the waiting list figures. At the end of 1953, 608 individuals were awaiting admission and of these 34 per cent. were classed by the Local Health Authorities as *most urgent* and 36 per cent. as *urgent*; moreover, 64 per cent. were under 16 years of age. In addition, it is estimated that 580 mental defective patients resident in the mental hospitals of the Region could be transferred to the mental deficiency institutions if accommodation were available. That the demand has increased in recent years is evident from the fact that only 520 cases were on the waiting list at the end of 1950 as compared with 608 at the end of 1953.

In view of the increasing demand for beds, the large number of patients involved, the degree of overcrowding, and apparent shortages of many types of staff, it has been desirable to examine the type of patient at present being cared for in the mental deficiency institutions of the region. As for a previous survey of the mental hospitals, information was obtained from forms designed for completion at site. The immediate aims of the present survey include:

(*i*) a classification of types of patient in each so-called ward in terms of certain well-defined criteria;
(*ii*) a review of the disposition of nursing and domestic staff ward by ward, and of accommodation available;
(*iii*) a review of medical and various other types of staff employed;
(*iv*) a review of patients on full licence.

Analyses of the results are given in Sections 3–5 below and their implications are discussed in Section 6. Mention has elsewhere been made of mental defectives resident in mental hospitals; and defectives are also accommodated in other hospitals not designated as mental deficiency institutions. Unfortunately, the time at the writer's disposal did not permit of a survey of wards at these hospitals, but the proportion of such beds is only 7 per cent. of the total number of beds allocated to mental defectives in the Region. Furthermore, at the time of the survey one of the nine institutions in the Region had only recently been opened, and for this reason was not surveyed; at the time only seventy patients were in residence there. Any error resulting from exclusion of patients in these hospitals is trivial.

3. Accommodation Available for Mental Defective Patients in the Birmingham Region

The Wood Committee (1929) estimated that there were 32 mental defectives per 10,000 in the rural areas and 22 per 10,000 in the urban districts who needed institutional care. For this Region, which has a population of 4,444,000, it is therefore estimated that about 10,500 beds are required. Actually there are nine colonies providing 5,029 beds, and in addition 394 beds are set apart for mental defectives in other hospitals, so that accommodation is provided at the rate of 1,220 beds per million population. The national rate is 1,250 beds per million population, which the Board of Control regards as seriously inadequate.

Whereas the mental defective institutions as a whole are less seriously overcrowded than the mental hospitals (Cross, 1954), the position varies considerably from colony to colony and indeed from ward to ward in the same colony. Since a total overcrowding figure for a given institution is misleading, Table III has been prepared to show the numbers of wards overcrowded at night within certain ranges of overcrowding; male, female, and mixed (mostly children's) wards are considered separately.

Male Wards—All the wards are overcrowded at each of five hospitals and at three of them the position is serious. The relatively large number of wards overcrowded by more than 30 per cent. at St Margaret's is particularly noticeable. Almost two-thirds of the wards in the Region are overcrowded, and almost half the total number of wards are overcowded by 20 per cent. or more.

Female Wards.—The picture here is less disturbing, in that only 43 per cent. of the total number of wards are overcrowded and only 14 per cent. are overcrowded by 20 per cent. or more. At only two hospitals are all the wards overcrowded.

Mixed Wards.—These are small in number and on the whole are overcrowded to about the same degree as the female wards.

Consideration of the ward returns for adult wards reveals the interesting fact that wards with low grade patients (see classification of wards in Section 4) are overcrowded to a greater degree than medium grade wards, and that the latter are overcrowded to a greater degree than the high grade wards.

4. Analysis of Patients in Residence

We may now proceed to examine data referable to the patients resident in the mental deficiency institutions of the Region at the time of the survey. Relevant information was obtained ward by ward and summarized by hospital for males and females

TABLE III

SLEEPING ACCOMMODATION FOR MENTAL DEFECTIVE PATIENTS IN THE BIRMINGHAM REGION

Wards	Name of Hospital	Statutory Accommodation	No. of Patients	Per cent. Overcrowding	No. of Wards Open	No. of Wards Overcrowded	No. of Wards Overcrowded				
							0·1–4·9 Per cent.	5–9·9 Per cent.	10–19·9 Per cent.	20–29·9 Per cent.	30 Per cent. and over
Male	Stallington Hall ..	230	222	—	4	—	—	—	—	—	—
	St. Margaret's ..	581	747	28·6	12	12	1	1	—	3	7
	Monyhull Hall ..	409	393	—	7	1	1	—	—	—	—
	Middlefield Hall ..	271	245	—	5	—	—	—	—	—	—
	Coleshill Hall ..	174	241	38·5	3	3	—	—	—	—	3
	Weston Colony ..	58	66	13·8	1	1	—	—	1	—	—
	Marston Green ..	240	307	27·9	6	6	—	—	1	4	1
	Lea Colony	44	52	18·2	2	2	—	1	—	1	—
	Totals	2,007	2,273	13·3	40	25	2	2	2	8	11
Female	Stallington Hall ..	170	180	5·9	3	3	1	1	1	—	—
	St. Margaret's ..	662	629	—	12	3	—	—	2	1	—
	Monyhull Hall ..	472	442	—	9	—	—	—	—	—	—
	Coleshill Hall ..	194	208	7·2	3	3	1	1	1	—	—
	Weston Colony ..	130	143	10·0	2	1	—	—	—	1	—
	Marston Green ..	195	213	9·2	4	3	—	—	—	3	—
	Lea Colony	88	91	3·4	4	3	3	—	—	—	—
	Totals	1,911	1,906	—	37	16	5	2	4	5	—
Mixed	Stallington Hall ..	124	105	—	3	1	1	—	—	—	—
	St. Margaret's ..	27	33	22·2	1	1	—	—	—	1	—
	Monyhull Hall ..	62	44	—	2	—	—	—	—	—	—
	Marston Green ..	132	129	—	3	—	—	—	—	—	—
	Lea Colony	64	75	17·2	3	3	—	1	1	—	1
	Totals	409	386	—	12	5	1	1	1	1	1

TABLE IV

PERCENTAGE AGE DISTRIBUTION OF PATIENTS IN RESIDENCE AND OF POPULATION OF BIRMINGHAM REGION

Age Group (years)	Male			Female		
	Population	Mental Defectives	M.D.s per 10,000 pop.	Population	Mental Defectives	M.D.s per 10,000 pop.
0–4	9·3	0·9	1·1	8·7	0·8	0·8
5–9	8·2	4·7	6·3	7·8	3·9	4·7
10–14	7·4	7·5	11·1	6·6	6·6	9·3
15–19	6·4	12·1	21·0	6·2	8·6	13·0
20–24	7·0	13·9	21·9	7·0	9·9	13·4
25–34	15·9	24·5	17·1	15·0	21·2	13·2
35–49	23·2	26·6	12·7	22·1	30·4	12·9
50–64	14·8	8·7	6·6	16·1	16·0	9·3
65 and over	7·8	1·1	1·5	10·5	2·6	2·4
Totals ..	100·0	100·0 (2,440)	11·2	100·0	100·0 (2,125)	9·4

separately. In what follows a regional summary is given for each of a number of items together with the range of inter-hospital variation where appropriate.

Age Distribution.—The percentage distribution for each sex is shown in Table IV together with that of the general population. It will be noted that 13·1 per cent. of the males and 11·3 per cent. of the females are under 15 years of age, and that the proportion of males is greater than that of females for each age group specified up to and including the 25–34 age group. The converse is true for the older age groups and the difference for the 50–64 group is most spectacular. Table IV also shows the numbers of mental defectives per 10,000 population in each age group, and, whereas there is no sizeable difference between the overall rates for males and females, there are large differences between the sexes for the three central age groups specified. The male rates for groups 15–19 and 20–24 exceed the corresponding female rates by 60 per cent., and the male rate for the group 25–34 exceeds the female rate by almost 30 per cent.

Degree of Mental Deficiency.—This is shown in Table V for each sex separately with the percentages of children and adults by age and grade. There is close agreement between the distributions by grade for male and female children respectively; slightly more than one-fifth are idiots and a relatively small proportion (10·8 per cent.) are high-grade. Of the adults, 47 per cent. are classified as feeble-minded, the proportion of females exceeding that of males; almost exactly half of all the adults are classed as imbeciles and only 3 per cent. are idiots.

These results relate to patients in residence; patients on full licence are considered separately on p. 167. For

TABLE V

PERCENTAGE OF ALL CHILDREN, AND ALL ADULTS, BY AGE, SEX, AND GRADE

(Total numbers shown in brackets)

Age Group (years)		Male				Female				Totals			
		a	*b*	*c*	Total	*a*	*b*	*c*	Total	*a*	*b*	*c*	Total
Children	0–4	—	3·8	3·2	7·0	—	5·4	1·3	6·7	—	4·5	2·4	6·9
	5–9	1·6	26·7	7·6	35·9	0·4	22·7	11·8	34·9	1·1	25·0	9·3	35·4
	10–14	9·8	36·5	10·8	57·1	9·7	40·8	7·9	58·4	9·8	38·3	9·6	57·7
	Totals ..	11·4 (37)	67·0 (216)	21·6 (70)	100·0 (323)	10·1 (25)	68·9 (167)	21·0 (50)	100·0 (242)	10·8 (62)	67·8 (383)	21·3 (120)	100·0 (565)
Adults	15–19	4·9	7·9	1·1	13·9	4·5	4·6	0·6	9·7	4·8	6·3	0·8	11·9
	20–24	7·3	7·9	0·8	16·0	5·6	5·0	0·6	11·2	6·5	6·5	0·7	13·7
	25–34	13·8	13·5	0·9	28·2	11·7	11·3	0·8	23·9	12·8	12·5	0·9	26·2
	35–49	13·5	16·5	0·6	30·6	16·5	17·4	0·4	34·2	14·9	16·9	0·5	32·3
	50–64	4·6	5·5	—	10·1	9·7	8·1	0·2	18·0	7·0	6·7	0·1	13·8
	65 and over	0·5	0·7	—	1·2	1·9	1·1	—	3·0	1·1	1·0	—	2·1
	Totals ..	44·6 (944)	52·0 (1,101)	3·4 (72)	100·0 (2,117)	49·9 (940)	47·5 (894)	2·6 (49)	100·0 (1,883)	47·1 (1,884)	49·9 (1,995)	3·0 (121)	100·0 (4,000)
Grand Totals ..		40·2 (981)	54·0 (1,317)	5·8 (142)	100·0 (2,440)	45·4 (965)	49·9 (1,061)	4·7 (99)	100·0 (2,125)	42·6 (1,946)	52·1 (2,387)	5·3 (241)	100·0 (4,565)

a = feeble-minded *b* = imbecile *c* = idiot

this reason these findings are not comparable to those given by O'Connor and Tizard (1954) in their survey of a sample of patients in twelve mental deficiency institutions. When adults on full licence are included with the above the proportions of all adults classed as feeble-minded, imbecile, and idiot become 50, 47, and 3 per cent. respectively; O'Connor and Tizard obtained proportions of 58, 39, and 3 per cent.

Mobility and Incontinence.—A regional survey of mobility and incontinence yields the following information. The number of bed-ridden patients in the adult wards is very small, and the proportion of such cases is only 1 per cent. of all patients in these wards. The corresponding proportion for children is 11 per cent., and such patients make considerable demands upon the nursing strengths of institutions.

Habitual incontinence also presents a great problem in the children's wards, where 61 per cent. of the patients have this condition. The range of inter-hospital variation about the regional average is 51·6 per cent. to 77·5 per cent. In the male adult wards 18 per cent. are incontinent, the corresponding proportion for the female adult wards being 12 per cent.

Diagnostic Classification.—The numbers of patients falling into certain important diagnostic categories were also recorded in the ward returns for each institution here considered. These categories are specified in Table VI, which gives the results of a regional summary of the ward returns. The diagnoses here recorded are those commonly associated with mental deficiency and which require skilled nursing care and medical supervision. As one and the same patient may occur under two or more of these headings the numbers for the various categories are not additive.

It must be mentioned that the provision for tuberculous patients differs considerably from institution to institution. At some the patients are segregated in a separate ward, at others they are accommodated in side rooms of the hospital block and at others they are transferred to a sanatorium as soon as possible. Thus the numbers in residence at a particular institution depend on the provision made, and the proportions at the various institutions vary accordingly. Of the tuberculous patients given in the Table, seventy adult males and 35 adult females are at one institution which has a special block on the male side and one on the female side.

Organic disorders of the central nervous system occur in a significantly larger proportion of male adults than in female adults, and in almost twice as many children as in the male adults. Almost equal proportions of male and female adults are on the epileptic registers and the proportion of epileptic children exceeds the adult proportion in the ratio of two to one. A significantly larger proportion of female adults were found to be suffering from disorders of the cardiovascular system than males, the corresponding proportion of children being almost exactly the same as for male adults. Finally, the proportions of patients with psychotic tendencies are given under each heading, the proportion for male adults being almost twice as great as for female adults; the number of children diagnosed as such is, as would be expected, very small.

TABLE VI
DIAGNOSTIC CLASSIFICATION

Diagnostic Category	Adults				Children	
	Males		Females			
	No.	Per cent. of Total	No.	Per cent. of Total	No.	Per cent. of Total
Organic Disorders of C.N.S.	234	11·1	131	7·4	134	21·2
Tuberculosis (notified)	94	4·5	43	2·4	3	0·5
Epilepsy (patients on register)	286	13·6	257	14·4	166	26·2
Cardiovascular Disorders	57	2·7	75	4·2	18	2·8
Psychosis	90	4·3	39	2·2	4	0·6

Employment of Patients in Residence.—The numbers of patients employed on different types of work are, of course, partially dependent upon the facilities available. At one colony suitable patients may go out on daily licence to local farms and gardens, whereas at another they will work within the grounds of the institution. Table VII gives a regional summary of patients over school age by place of employment for males and females separately.

TABLE VII
PERCENTAGE DISTRIBUTIONS BY PLACE OF EMPLOYMENT

Place of Employment	Males	Females
On daily licence	6·9	8·2
Employed on wards	24·5	25·2
Employed elsewhere in hospital	45·0	41·1
Unemployed	20·1	22·7
Sick	3·2	1·8
On leave	0·3	1·0
Total	100·0	100·0

For the reason given above it is perhaps more appropriate to consider those patients on daily licence with those employed in the hospital other than in the wards (51·9 per cent. of males and 49·3 per cent. of females). Broadly speaking therefore,

half the patients over school age are employed in some capacity outside the wards and one-quarter are employed on the wards; the remainder are either sick or unemployable. From a detailed analysis of patients by place of employment it is found that the most common occupations of the male patients are ward work, farm work, gardening, other work on the land, and labouring; those of the female patients are laundry work, sewing, and domestic work in the wards and in other parts of the hospital buildings.

Classification of Wards by Type of Patient.—It is instructive to examine the ward returns with a view to classifying the wards at each colony by type of patient against the background of various items considered above. The wards may be classified into three major groups: high grade, medium grade, and low grade. Adult male, adult female, and children's wards were considered separately in making this classification, as there are different levels of assessment for each of these groups. The wards falling into each group by this method were checked against the typing as given by individual institutions and a large measure of agreement was found.

The first group comprises wards housing ambulant patients, the large proportion of whom are classed as feeble-minded, and are employed for the most part outside the wards or are on daily licence. There are, of course, no idiots in these wards, and, with only very minor exceptions, no patients in these wards are habitually incontinent or have conditions which come under the diagnostic categories previously mentioned. The third group of wards is also easy to specify; here a large proportion of patients are classed as imbeciles and most of them include a number of idiots. The proportions not employed, or employed only in own ward, are large, as are also the proportions of incontinent patients and bedridden patients. The second or intermediate group combines all which do not fall into the above dichotomy. The only wards excluded from this classification are the hospital blocks, which are small in number and size and do not merit further analysis. This classification will be used to review the availability of nursing staff at the time of the survey.

Patients on Full Licence.—At the time of the survey, there were 281 male and 255 female patients on full licence from these institutions; their distribution by sex, age, and grade is given in Table VIII for all institutions taken together; the distribution of children under 15 by grade is shown separately. Few children go out on full licence and the large majority of these were classed as imbeciles. Three-quarters of all adults were classed as feeble-minded, the remainder, with only six exceptions, as imbeciles; 70 per cent. of feeble-minded adults were aged between 25 and 50, as were 66 per cent. of adult imbeciles. Of all adults on full licence only 9·3 per cent. were over 50 years of age and the large majority (68·6 per cent.) were in the age group 25–49 inclusive. Whereas the distribution of all male adults by grade differs little from the corresponding female distribution, there are sizeable differences in respect of proportions for the same age group in the two distributions. The proportion of females aged 50 years and over far exceeds that of males and the same is true of the age group 35–49; the proportion of females aged 35 years and over is 58·3 per cent. as compared with 30·6 per cent. for males. The converse is of course true of the younger age groups, the difference in the age group 20–24 being particulary

TABLE VIII

PERCENTAGE DISTRIBUTION OF PATIENTS ON FULL LICENCE BY SEX, AGE, AND GRADE

(Total numbers shown in brackets)

Age Group (years)	Male				Female				Totals			
	a	*b*	*c*	Total	*a*	*b*	*c*	Total	*a*	*b*	*c*	Total
Under 15	— (—)	90·0 (9)	10·0 (1)	100·0 (10)	— (—)	76·9 (10)	23·1 (3)	100·0 (13)	— (—)	82·6 (19)	17·4 (4)	100·0 (23)
15–19	3·3	2·6	0·4	6·3	0·8	2·5	1·2	4·5	2·2	2·5	0·8	5·5
20–24	17·4	6·6	—	23·9	6·3	2·0	—	8·3	12·1	4·5	—	16·6
25–34	29·3	8·5	0·7	39·1	22·7	6·2	—	28·9	26·5	7·4	0·4	34·3
35–49	19·9	7·0	—	26·9	32·7	9·9	—	42·6	25·9	8·4	—	34·3
50 and over	3·3	0·4	—	3·7	14·0	1·7	—	15·7	8·3	1·0	—	9·3
Totals ..	73·8 (200)	25·1 (68)	1·1 (3)	100·0 (271)	76·5 (185)	22·3 (54)	1·2 (3)	100·0 (242)	75·0 (385)	23·8 (122)	1·2 (6)	100·0 (513)
Grand Totals	71·2 (200)	27·4 (77)	1·4 (4)	100·0 (281)	72·5 (185)	25·1 (64)	2·4 (6)	100·0 (255)	71·8 (385)	26·3 (141)	1·9 (10)	100·0 (536)

a = feeble-minded *b* = imbecile *c* = idiot

striking. These differences are also found when comparing the male and female age groups by grade: 61 per cent. of all feeble-minded females are aged 35 years and over, as compared with 31·5 per cent. of feeble-minded males; 51·8 per cent. of female imbeciles are aged 35 and over as compared with 29·4 per cent. of males.

We now consider the proportions of male and female patients who are on licence to certain licensees. Table IX shows striking differences between the two percentage distributions. Of all males, 72 per cent. are on licence to relatives or friends, as compared with 44 per cent. for females; only 5·3 per cent. of males are on licence to hospitals (not for medical treatment) as compared with 19 per cent. for females; also, the proportion of males on licence to an employer (excluding hospital authorities) is less than half the corresponding proportion of females. We may conclude, therefore, that although the proportion of males (79 per cent.) who receive a definite wage or salary exceeds the corresponding proportion of females (72 per cent.), employing authorities are more willing to accept responsibility for female mental defectives than for males. In fact, hospital authorities and private individuals employ females as domestic workers and at the same time accept responsibility for their supervision. On the other hand, the main source of employment of male mental defectives is labouring on farms, or in gardens, or factories, so that the males are not resident with their employers but travel to their place of employment each day. The responsibility for such patients falls therefore upon the relatives or friends with whom they reside.

TABLE IX

DISTRIBUTION OF PATIENTS ON FULL LICENCE BY LICENSEE

On Licence to	Male		Female	
	No.	Per cent.	No.	Per cent.
Same Hospital (*e.g.* Matron) ..	4	1·4	17	6·8
Other Hospital or Institution*	11	3·9	31	12·2
Local Authority	14	5·0	—	—
Relative or Friend	203	72·2	113	44·2
Employer	48	17·1	93	36·4
Other†	1	0·4	1	0·4
Totals	281	100·0	255	100·0

* Except for purely medical treatment.
† Another hospital primarily for medical or surgical treatment.

These aspects of the employment of male and female mental defectives probably account for the differences mentioned above in the age distributions of males and females. Whereas domestic work is commonly undertaken by women in the older age groups, labouring calls for a level of physical fitness more often found in the younger age groups. Moreover, there is a great demand for domestic workers at the present time both within the Hospital Service and by the general public; but the current demand for labourers is not so great.

5. STAFF

Medical Staff.—The following whole-time medically qualified members of the staff were employed in the Region at the end of 1953:

Seven Consultants,
Four S.H.M.O.s,
One Senior Registrar,
Two Registrars,
Four J.H.M.O.s (including two locums).

There were no medical staff of S.H.O. or H.O. grade. In addition to these, two general practitioners were employed on a part-time basis at one institution as clinical assistants. There are therefore 430 patients per consultant or S.H.M.O., and 260 patients per doctor in the Region as a whole. With the exception of one institution, the patient-doctor ratios at individual institutions lie close to the latter regional average. To complete the picture, one should add that there were in fact three vacancies on the J.H.M.O. grade, and two on the S.H.O. grade. It would therefore appear that requirements as indicated by the establishments laid down are satisfied in respect of senior medical staffs, but, as is true of the mental hospitals, there are difficulties of recruitment of junior medical staff.

Professional and Technical Staff.—Four types of staff under this heading are of interest to the survey:

Occupational therapists,
Psychiatric social workers,
Psychologists,
School teachers.

In all, six full-time occupational therapists were employed at the time of the survey (three of them at one institution and one at each of the three others) and a part-time occupational therapist was employed at a fifth for 32 hours per week. Only one institution had a psychiatric social worker, but one group (Monyhull and Middlefield Hall) had the services of two psychologists; no other institution employed a psychologist. Nine full-time teachers and school supervisors were employed (four at one institution, three at another, and two at a third), and a part-time school teacher was employed for 2 hours per week at two other institutions here considered.

Nursing Staff.—Table X (opposite) gives the nursing staffs employed on December 31, 1953, in the institutions here considered. In the Region as a whole, 274 full-time and two part-time male nurses

TABLE X

NURSING STAFF EMPLOYED ON DECEMBER 31, 1953

Sex of Staff	No. of Patients in Residence	Staff Employed (part-time staff shown in brackets)					No. of Patients per Trained Staff*	No. of Patients per Nurse*
		Trained	Student	Nursing Assistant	Other	Total		
Male	2,221	182	33	54 (2)	5	274 (2)	12·2	8·1
Female	2,354	127 (36)	46	98 (201)	13 (11)	284 (248)	16·2	5·8

* whole-time equivalents

are employed; of these 66 per cent. are already trained and 12 per cent. are students. Of the 284 female full-time nurses, 45 per cent. are trained and 16 per cent. are students; thus a greater reliance is placed on nursing assistants on the female side. The large proportion of part-time nursing assistants (81 per cent. of all the part-timers) is also striking. It should be mentioned, however, that 79 of these are employed at one institution (Lea Colony).

The ratios exhibited in Table X, whereby patients are related to trained nurses (or full-time equivalents), show that, in the Region as a whole, the male side is better staffed than the female. There is a greater inter-hospital variation for the female than for the male ratios; this is probably due to the varying degrees of availability of part-time female staff. When all nurses are considered, the female side is better staffed than the male, although again there is considerable variation between the hospitals.

However, an evaluation of total nursing staff to patients in residence is misleading for the following reasons:

(*a*) senior members of the nursing staff do not work in the wards;

(*b*) at any one time, a proportion of the staff is on annual leave or sick leave, or off duty;

(*c*) wards housing patients of differing grades have different nursing requirements;

(*d*) distinction should be made between day and night availability.

Thus an assessment of nursing staff available should be made on a ward basis. By recourse to the ward returns previously mentioned, an attempt has therefore been made to give a picture of nursing staff by ward on any one day or night; the grade of nursing staff, whether trained, student, or assistant, was also obtained.

Accordingly, we can review the availability of nursing staff against the three-fold classification of wards made in Section 4 above, thus taking into account the type of patient involved. A consolidation of the figures given for each ward by recourse to this classification provides patient-staff ratios at each hospital for male, female, and children's wards respectively. These ratios vary from institution to institution within the same class, but the overall ratios for the Region as a whole give reliable estimates of the relative availability of staff (Table XI).

TABLE XI

CLASSIFICATION OF WARDS BY TYPE OF PATIENT AND AVAILABILITY OF NURSING STAFF

Time	Type of Patient	Grade of Ward			
		High	Medium	Low	All Grades
Day	Adult Males ..	27	25	24	25
	Adult Females	19	18	16	18
	Children ..	16	14	10	11
Night	Adult Males ..	63	63	64	63
	Adult Females	64	56	62	61
	Children ..	31	55	41	43

Each ratio depicts the average number of patients which is looked after by a nurse during the day and night respectively. It should be mentioned that at night a few wards do not have staff allocated to them but are patrolled at regular intervals by staff from other wards or by a small complement of relief staff. Furthermore, the ratios depicted for night duty are based on large numbers of patients and small numbers of staff and are liable to considerable variation.

It should also be mentioned that, in calculating the patient-staff ratios by day, the total number of patients on each ward has been used. On the high grade wards, in particular, a proportion of the patients will be out on daily licence; but as such patients are only outside the hospital for part of the day it was considered that more reliable results would be obtained by including them in the number of patients to be related to the nursing strength of each ward.

The disposition of staff by *day* is clearly defined. For each group of wards there is a greater availability of staff on the children's wards than on the adult wards, and a greater availability on the adult

female than on the adult male wards. As would be expected, the patient-staff ratios decrease from the high-grade to the low-grade wards, although such decreases are very slight for the adult wards. This may be due to the extra supervision of behaviour and the efforts at socialization required for the high-grade patients. As would be expected, the low-grade children's wards have more staff than any other type of ward.

The disposition of staff by night suggests that each type of adult ward is given the same degree of supervision by night. The staffing of the female adult wards at night is no better than that of the male adult wards, and this is probably due to the fact that the large number of female part-timers are not available at night. The children's wards of all grades are better staffed than the adult wards; broadly speaking there is a nurse on each ward at night.

A breakdown taking into account the grade of staff on each ward by day did not yield a wholly satisfactory outcome owing to the small numbers of staff involved when so classified. The adult male wards have on the whole a slightly better coverage of trained staff than the female wards; and the converse is true when other grades are considered. The children's wards have a greater availability of trained staff than the adult wards.

6. Discussion

This survey brings into focus several aspects of the problem of appropriate provision of accommodation for mental defectives. Estimates of future requirements in terms of beds and staff within the existing legal framework must take stock of possible changes with reference to the incidence of mental deficiency in the general population. In view of the complex nature of the various issues involved, biological, environmental, and geographical, it is difficult to make any assessment of such changes. Availability of facilities for home-care is itself a decisive circumstance which we cannot forecast with confidence. An examination of current admission, discharge, and death rates in relation to the existing waiting lists provides all the available relevant information about legal bed requirements for the immediate future.

During 1953, a total of 542 patients were admitted to *all* mental deficiency institutions in this Region; 60 per cent. of these entries were new admissions and the remainder were re-entries for various reasons. A total of 428 patients were discharged or returned to licence and the total number of deaths in 1953 was 62, including sixteen deaths of children under 16. The total population resident in all institutions of the Birmingham Region on December 31, 1953, was 4,810, including 718 children. The proportion of total entries during 1953 to the total resident population was therefore 11·2 per cent. and the proportion of removals from hospital to the resident population was 10·2 per cent. This implies a very small annual turnover of patients. The death rates for adults and children were 1·1 and 2·2 per cent. respectively. The number of new cases put on the waiting lists of Local Authorities in 1953 (372) exceeded the number of new admissions by 49. Unless discharge and death rates increase during the next few years, we may conclude that the Region will have to provide an additional 600 beds, if there is to be any appreciable reduction even in the existing waiting lists. There is nothing to show that these rates will increase; but there is good reason to assume that waiting lists will continue to increase in the future.

At the same time provision should be made for the transfer to a suitable institution of those non-psychotic mental defectives now accommodated in mental hospitals. This is desirable both from the point of view of the patients themselves and from that of the mental hospitals, which are seriously overcrowded and understaffed. To meet this demand, it is estimated that about 580 additional beds are requisite, and of these 45 are needed for children under 16 years of age. These additional requirements take no account of the present overcrowding in the mental deficiency institutions. The degree of overcrowding in individual wards has been ascertained and the results reveal a shortage of accommodation which is not always apparent, if reliance is placed upon one figure for the institution as a whole. If we assume that none of the patients can be transferred to other wards, either for clinical reasons or by virtue of their grading and/or behaviour, a further 430 additional beds are required, making a grand total of 1,610 beds, 470 of them for children under 16.

We now proceed to consider staff requirements of mental deficiency institutions with special reference to medical and nursing staff. Mention has already been made of the difficulties of recruitment of junior medical staff. That such difficulties exist is not surprising, since there are (as yet) no forms of treatment for mental defect. Consequently, the young clinician is unlikely to regard employment in institutions which offer such limited scope for his clinical interests as an attractive prospect.

Without dismissing the value of some medical supervision where neither treatment nor prevention is the end in view, the need for engaging larger medical staffs, if this were possible, or even of

retaining the present complement, calls for careful scrutinity *vis à vis* the present economic difficulties of the Hospital Service. It is undoubtedly true that the mental defective, whether living in an institution or elsewhere, needs life-long special care and supervision, but it is at least doubtful whether the medical requirements of 5,000 mental defectives in institutions justifies the expenditure of almost £35,000 per annum on the salaries of medical staffs alone.

We have seen that individuals suffering from epilepsy and those disorders of the central nervous system often associated with mental defect are to be found among the population of special schools and occupation centres. Presumably any complications arising from such conditions are the concern of the patient's general practitioner, often with a practice of over 2,000 people. The incidence of these conditions as disclosed by Table VI is doubtless higher among institutionalized mental defectives than in the general population; but, with the possible exception of children, they certainly do not constitute a problem of sufficient magnitude to merit a patient/doctor ratio of 260, *i.e.*, roughly ten times the medical coverage in the general population. Moreover, we have seen that 77 per cent. of the males and 70 per cent. of the females in residence are aged between 15 and 50 and morbidity rates for this age group are relatively very low. A sizeable financial saving would be made if medical supervision of the colonies became the responsibility of the medical superintendent in collaboration with local general practitioners; such considerations are perhaps worthy of closer examination than they have hitherto received.

Shortage of nursing staff in these institutions is a matter of great concern to Regional Boards; and it is very doubtful whether it would be possible to recruit sufficient nurses to staff the additional beds required even if such beds were available. In the Birmingham Region the number of full-time *male* nurses has remained almost constant since 1949, while the number of full-time *female* nurses has increased by 40 per cent. in the last 4 years, and the number of part-time female nurses has also increased by 40 per cent. However, these increases on the female side have been effected by the recruitment of larger numbers of nursing assistants; such individuals are ineligible for the posts of ward sister and their appointment offers no security for the future. The most serious aspect of the present staffing structure of the institutions is the falling recruitment and high wastage rate of student nurses. This will inevitably create new staffing problems of the colonies in the immediate future. The number of male students in training has decreased by almost 60 per cent. from 79 in 1949 to 33 in 1953; the number of female students decreased by 40 per cent. from 79 in 1949 to 46 in 1953. In a survey of student nurse wastage (Cross and Hall, 1954) a rate of 80 per cent. was recorded for students in the Birmingham Region. Almost 30 per cent. of those leaving before completion of training did so for financial reasons, and a more realistic scale of salaries seems necessary to attract nursing staff, especially male staff, to the colonies. Other important facets of student nurse wastage are the hours of duty, the present syllabus of mental deficiency nurse training, and shortages of domestic staff.

An evaluation of future nursing staff requirements must also take into account the needs of the various classes of patient. The disposition of nurses at present employed has been analysed in Section 5 and a similar method could be adopted to assess the number of nurses of different grades which should be available by day and night. Requirements in terms of trained staff should be accurately assessed so that those available to institutions for the mentally defective are employed to the fullest advantage. It is not possible to assess statistically the requirements of staff, other than medical and nursing since the numbers needed at each institution depend upon many individual circumstances.

I should like to record my appreciation of the co-operation which I have received from the staffs of the mental deficiency institutions, in particular from the medical superintendents and nursing staffs who were concerned in the extraction of detailed information referable to the patients in residence. My thanks are also due to Dr. R. F. Wrighton, one-time Research Fellow in this Department, for his invaluable assistance in the collection of data, to Dr. H. M. Cohen for permission to examine the records of individuals attending or resident in the Birmingham schools for educationally sub-normal children and occupation centres, to Professor Lancelot Hogben, F.R.S., for his advice at all stages of this survey, and to Dr. M. Sim for many helpful suggestions.

REFERENCES

Cross, K. W. (1954). *British Journal of Preventive and Social Medicine*, **8**, 29.
—— and Hall, D. L. A. (1954). *Ibid.*, **8**, 70.
O'Connor, N., and Tizard, J. (1954). *Brit. med. J.*, **1**, 16.
Penrose, L. S. (1949). "The Biology of Mental Defect", p. 50. Sidgwick and Jackson, London.
Tredgold, A. F. (1947). "A Textbook of Mental Deficiency", 7th ed. p. 163. Baillière, Tindall and Cox, London.
Report of the Mental Deficiency Committee (Wood Report) (1929) H.M.S.O., London.

Brit. J. prev. soc. Med. (1954), **8**, 172–175

CHANGING PATTERN OF MORTALITY IN ENGLAND AND WALES

II. MATERNAL MORTALITY

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The *crude* death rate for females fell from 13·7 in 1911 to 11·6 in 1931. The Life Table death rate, *i.e.* the death rate duly standardized with reference to the changing age structure of the population fell from 18·1 to 15·9 in the same period. Meanwhile the infant mortality rate had also fallen from 109 in 1911–15 to 62 in the quinquennium 1931–5; but no such decline took place in deaths associated with childbirth. In 1921, the maternal mortality rate for England and Wales was 4·09 per thousand live births; in 1931 it was 4·28, but by 1941 it had fallen to 2·9, and by 1951 to 0·84. We may fairly confidently predict that by 1961 the current rate will not exceed half the latter figure. The circumstances of these very large changes are worthy of attention in retrospect, for it is clear that medical opinion at the time when the decline set in was neither capable of forecasting it nor indeed of explaining why the maternal mortality rate had till then failed to follow the same course as other death rates in that period.

The year 1934 registers a higher figure for puerperal mortality than for any since 1911, and the failure of the puerperal mortality rate to decline with the general death rate prompted the Ministry of Health to undertake an investigation, the findings of which became public in 1937. In summarizing them, the Report states frankly, but not informatively, that:

> . . . it appears to be the collective influence of many factors which predisposes towards puerperal mortality and the effects of the individual factors cannot be dissociated and separately assessed.

Before examining the decline, it is first necessary to define the meaning of the term *maternal mortality*, more especially because our period covers some years in which the public statistics are referable to the 4th revision and others in which they are referable to the 5th revision of the list of causes of death used in the reports of the Registrar-General of England and Wales.

The following definition is taken from the special Ministry of Health Report (1937):

> With almost negligible exceptions, those deaths in which pregnancy or childbirth was a primary cause of death are classified by the Registrar-General into one group, namely, puerperal mortality. There remains, however, a group of cases which are excluded from the deaths "Classed to" pregnancy or childbirth by the operation of the "code", but in which some mention is made on the certificate of pregnancy or childbirth . . . these deaths are collected by the Registrar-General and described as deaths "associated with" pregnancy and childbirth.

Since the primary cause of death in this group of associated deaths is non-maternal, the rates discussed have been calculated on the puerperal mortality

TABLE I

PUERPERAL MORTALITY, 1921–52, IN TERMS OF THE 4TH AND 5TH REVISIONS

Year	Live Births	4th Revision		5th Revision	
		Puerperal Mortality		Puerperal Mortality	
		No.	Per 1000 Live Births	No.	Per 1000 Live Births
1921	848,814	3325	3·92	3475	4·09
1922	780,124	2973	3·81	3107	3·98
1923	758,131	2895	3·82	3025	3·99
1924	729,933	2847	3·90	2975	4·08
1925	710,582	2900	4·08	3030	4·26
1926	694,563	2863	4·12	2992	4·31
1927	654,172	2691	4·11	2812	4·30
1928	660,267	2921	4·42	3052	4·62
1929	643,673	2791	4·34	2917	4·53
1930	648,811	2855	4·40	2983	4·60
1931	632,081	2601	4·11	2706	4·28
1932	613,972	2587	4·21	2683	4·37
1933	580,413	2618	4·51	2737	4·72
1934	597,642	2748	4·60	2880	4·82
1935	598,756	2457	4·10	2590	4·33
1936	605,292	2301	3·80	2431	4·02
1937	610,557	1988	3·26	2142	3·51
1938	621,204	1917	3·09	2096	3·37
1939	614,479	1815	2·95	1997	3·25
1940	590,120	1570	2·66	1641	2·78
1941	579,091	1606	2·77	1678	2·90
1942	651,503	1600	2·46	1672	2·57
1943	684,334	1550	2·26	1620	2·37
1944	751,478	1428	1·90	1492	1·98
1945	679,937	1206	1·77	1260	1·85
1946	820,719	1157	1·41	1209	1·47
1947	881,026	1014	1·15	1060	1·20
1948	775,306	776	1·00	811	1·05
1949	730,518	696	0·95	727	0·99
1950	697,097	593	0·85	620	0·89
1951	677,529	542	0·80	566	0·84
1952	673,735	477	0·71	498	0·74

4th Revision 1921–39 as given in 4th revision
1940–52 converted to 4th revision from 6th

5th Revision 1921–30 converted to 5th revision from 4th
1931–39 as given in 5th revision
1940–52 as given in 6th revision

Conversion ratio from 4th to 5th revisions = 1·045

*Holder of a Research Fellowship from the Rockefeller Foundation

alone. An appendix sets forth some of the changes made in successive revisions of the Registrar-General's Tables.

The trend of the puerperal mortality rate can be seen in Table I. The two sets of figures cited differ but little and follow the same course. How spectacular was the turning-point is clearer when we examine the graphical presentation of the data. For the reasons outlined in a previous paper in this series (Taylor, 1954) Fig. 1 exhibits them on a logarithmic scale and this clarifies the point at which a sustained decline begins. Here we may easily be misled by cursory inspection into thinking that 1935 marks the first year of decline from the high plateau of the period before 1934. It is true that the figure for 1935 is lower than that for 1934, and that the figure for 1936 is lower than that for 1935, but the 1936 rate is itself higher (5th revision) or not appreciably lower (4th revision) than the 1922 rate. We cannot therefore pinpoint 1936 as marking the start of a systematic fall in contradistinction to a temporary recession from an abnormally high value. As in a previous study of infant mortality (Taylor, 1954), we shall regard annual values as suspect and define a sustained decline as:

> A decline which has continued from a certain date D to the present time on the understanding that:
>
> (*a*) there is recorded on date D a level as low as in any previous year;
>
> (*b*) we neglect annual fluctuations if the mean figure for a given quinquennium from D onwards is no greater than its predecessor.

In this context, we accordingly regard 1937 as the first year of sustained decline. Ever since then the decline has continued, and the log-graph plot shows how regular it has been, the more so because a fixed proportionate decline on this scale follows the course of a straight line and an increasing proportionate decline follows the course of a curve which is downwards. The fall was not associated with the decline of live births from 1921 onwards. In that year they totalled 848,814. In 1952 they were 673,735, and in 1934 fertility in England and Wales was at a minimum. There were in 1934 only 597,642 live births, 70 per cent. of the figure for 1921; but the maternal mortality rate of 1934 considerably exceeded that of 1921.

In seeking elsewhere an explanation of the decline, it is advisable to break down the general puerperal mortality by cause of death. Accordingly, Table II exhibits the principal causes of maternal death during most of this period. As the Appendix explains, strict comparability is not possible after 1950 because of the drastic changes in the 6th revision of the standard mortality classifications.

The eight main categories in Table II (overleaf) cover 93·5 per cent. of puerperal deaths in 1931 and account for 91 per cent. of deaths in 1949. From

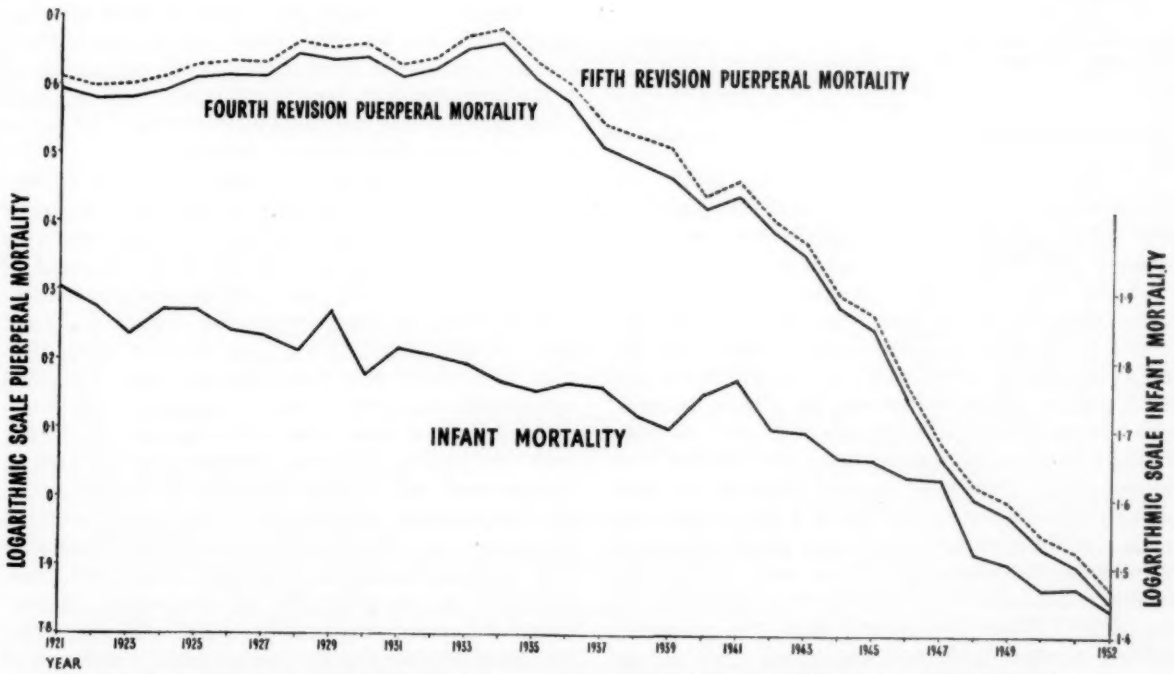

FIG. 1.—Course of puerperal mortality and infant mortality, 1921–52 (rates per 1,000 live births on logarithmic scale).

these we see that "toxaemias of pregnancy and puerperal toxaemias" and "infection during childbirth and the puerperium" alone represented 52·5 per cent. of total puerperal deaths in 1931. These, with the third largest group, "haemorrhage of pregnancy and childbirth", are shown in Fig. 2, which discloses the change of their relative importance during the period 1931–49. The most dramatic decline is that of "infection during childbirth and the puerperium", which fell from 1·41 in 1931 to 0·11 in 1949. In 1931, "infection" accounted for 34·3 per cent. of total puerperal deaths, making it by far the largest single cause of death, but by 1949 this accounted for only 11·6 per cent. of puerperal deaths. Meanwhile, the percentage of deaths from "toxaemias" had risen from 18·2 per cent. in 1931 to 28·7 per cent. in 1949, thus replacing "infections" as the largest single cause of puerperal death.

TABLE II
PRINCIPAL CAUSES OF PUERPERAL MORTALITY AS CLASSIFIED IN 5TH REVISION
(Percentage of total deaths)

Classification		Year				
No.	Cause of Death	1931	1935	1940	1945	1949
140	Post-abortive infection	10·4	12·6	9·6	13·8	10·7
141	Abortion without sepsis	6·2	5·3	6·6	4·7	4·9
143	Haemorrhage of pregnancy	2·4	2·1	1·9	1·4	2·2
144	Toxaemias of pregnancy	4·7	4·9	8·2	6·7	7·8
146	Haemorrhage of childbirth	9·8	9·2	12·3	14·0	12·1
147	Infection during childbirth and the puerperium	34·3	32·4	20·7	13·3	11·6
148	Puerperal toxaemias ..	13·5	13·9	16·1	18·9	20·9
149	Other accidents of childbirth	12·2	13·2	17·8	20·1	20·9
	Total	93·5	93·6	93·2	92·9	91·1

As elsewhere emphasized (Taylor, 1954), the interpretation of a time sequence of this sort is beset with many pitfalls, more especially because many putative contributory agencies come into operation gradually and to a greater or less extent synchronously. One may put a date to an Act of Parliament or to a therapeutic discovery, but the full implementation of a social service such as the maternity and child welfare clinics is necessarily a slow process; and the competent adoption of a new curative measure in general practice may also spread over several years. Only when we can pinpoint the start of a sudden sustained decline of a death rate, and relate it to the introduction of a new curative measure of indisputable efficacy which has come swiftly into widespread use, can we safely ascribe significance to the latter. Now it happens that the maternity welfare services had been extending their terrain appreciably during a quinquennium antedating the

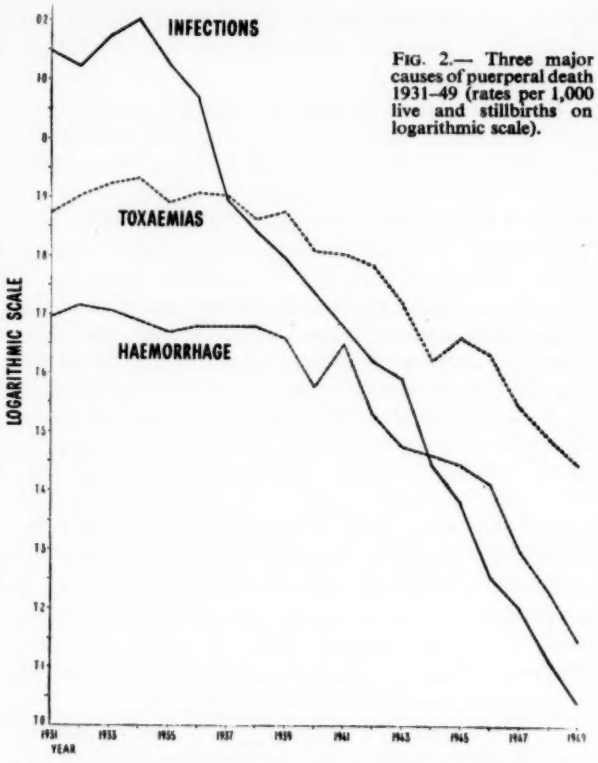

FIG. 2.— Three major causes of puerperal death 1931–49 (rates per 1,000 live and stillbirths on logarithmic scale).

start of the decline under discussion. It also happens that a bill to set up an organized midwifery service was introduced in 1936; but we may be certain that any beneficial consequences were gradual and not immediate. On the other hand, we can put a fairly precise date to the introduction into general use of a new treatment for puerperal sepsis, and we have already seen that the reduction of puerperal sepsis was the outstanding feature of the decline.

From 1930 Leonard Colebrook had studied puerperal fever in Queen Charlotte's Hospital Isolation Block, concentrating on cases involving haemolytic streptococci. At this time one-third of maternal deaths were due to sepsis, and the haemolytic streptococci were responsible for about 75 per cent. of fatal cases. It was not, however, until 1935 that Lancefield and Hare showed that, by using serological methods, these organisms could be divided into at least nine major groups (A to K), and that nearly all severe infection by haemolytic streptococci was caused by those of Group A. In the same year "Prontosil" was discovered in Germany. In a properly controlled experiment with this drug, Colebrook achieved a 75 per cent. reduction of mortality due to haemolytic streptococcal infection; and we may confidently assert that the use of sulphonamides quickly became widespread from 1937 onwards. Here, therefore, we seemingly

encounter one of the rare situations which endorse the identification of an agency of major importance as contributory to a statistical trend. Nor is it unlikely that the introduction of antibiotics has some relevance to the steepening gradients after 1943, but in the 1940s we have to take stock of new conditions. Throughout the later period, other agencies may also well have played a by no means unimportant role, *e.g.* the introduction of aseptic techniques, the reduction of anaemia among mothers, the control of haemorrhage, and the development of the blood transfusion service.

THE FUTURE.—The most satisfactory fit to the curve of puerperal mortality is that given by a quadratic parabola fitted for the years 1934–52. This method gives us an expected puerperal mortality rate of 0·03 per 1,000 live births in 1962. A logarithmic curve gives a less satisfactory fit, but extrapolation therefrom would lead us to forecast a fall indefinitely beyond 1952, with a rate of approximately 0·26 for 1962. In any event, it seems most unlikely that the maternal mortality rate at the end of the coming decade will be as high as half the current figure.

Acknowledgement is due to Prof. Lancelot Hogben, F.R.S., for advice and assistance.

REFERENCES

Ministry of Health (1937). "Report on an Investigation into Maternal Mortality." Cmd. 5422. H.M.S.O., London.
Taylor, W. (1954). *British Journal of Preventive and Social Medicine*, **8**, 1.

APPENDIX

In tracing the trend of puerperal mortality over a period of years, the changes in classification in the causes of death given in the decennial revisions of the international list must be borne in mind. Accordingly, in Fig. 1, the puerperal mortality rate from 1921 has been expressed in terms of the 4th revision (1929) and of the 5th revision (1938) by means of a conversion ratio, 1·045 (see Table I). The main difference in the total figures of puerperal mortality given in these two revisions is the inclusion in the 5th revision of deaths due to criminal abortions, *i.e.* those which were the subject of a coroner's inquest, which had previously been classified by the Registrar-General as "deaths from violence" and had consequently not been included in the puerperal group in the 4th and earlier revisions.

When tracing the course of any one cause through the revisions, certain variations in terminology and grouping occur.

Some of the more important causes of death are shown in the Appendix Table. The four major groups are roughly comparable, but the sections within these groups, even with the same title, are not comparable.

APPENDIX TABLE

Revision	4th		5th		6th	
	No.	Cause of Death	No.	Cause of Death	No.	Cause of Death
Classification	145	Puerperal sepsis	147	Infection during childbirth and the puerperium	680	Puerperal urinary infection without other sepsis
	148	Puerperal phlegmasia, alba dolens, embolism, and sudden death			681	Sepsis of childbirth and the puerperium
	146·2	Puerperal pyelitis and pyelonephritis (after delivery)			682	Puerperal phlebitis and thrombosis
					683	Pyrexia in the puerperium
					684	Puerperal pulmonary embolism
	144	Puerperal haemorrhage, plus	146	Haemorrhage of childbirth and the puerperium, plus	670 plus part of 671, 672	Delivery with placenta praevia, plus Delivery with retained placenta and other postpartum haemorrhage
	Part of 141·1	Accidental haemorrhage of pregnancy, and antepartum haemorrhage without abortion	143	Haemorrhage of pregnancy	643	Placenta praevia
					644	Other haemorrhage of pregnancy
	Part of 146	Puerperal albuminuria and convulsions	144	Toxaemias of pregnancy	642·0, 642·1	Hypertensive and renal disease of pregnancy
	Part of 147	Other toxaemias of pregnancy			Part of 642.4	Hyperemesis gravidarum (part)
	Part of 125.1	Acute yellow atrophy			Part of 642.5	Other toxaemias of pregnancy (part)
	Part of 146	Puerperal albuminuria and convulsions	148	Puerperal toxaemias	642·2	Pre-eclampsia of pregnancy
	Part of 147	Other toxaemias of pregnancy			642·3	Eclampsia of pregnancy
	Part of 125·1	Acute yellow atrophy			685	Puerperal eclampsia
					686	Other puerperal toxaemia
					642·4	Hyperemesis gravidarum (part)
					642·5	Other toxaemias of pregnancy (part)

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COMPARATIVE FERTILITY IN THE LOCAL GOVERNMENT AREAS OF ENGLAND AND WALES, 1951

BY

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In the course of time, the total population of a given area can grow in either or both of only two ways, *i.e.* by an excess of births over deaths and by an excess of immigrants over emigrants. In England and Wales, virtually nothing is known of internal migration, and estimates made from successive censuses (Taylor, 1950) inevitably can disclose trends alone. In analysing catchment areas for administrative data we may therefore most profitably first look at fertility. Here again sources are meagre, and little is known of the true fertility of sub-areas of England and Wales. Crude birth-rates, the most usual official indices of fertility, are misleading, since they take no account of age-sex structure. Comparison of proportions of children to total population in local government areas is likewise vitiated by two considerations:

(*a*) they merely reflect the fertility experience of the past decade;
(*b*) they entirely disregard the effects of emigration and immigration.

Thus a statement to the effect that Newtown A is of inherently high fertility because it has a large annual number of births has no prognosticatory value, since some standardizing procedure to take stock of the age-sex-marital structure is an indispensable prerequisite to legitimate comparison. With that end in view the Registrar-General introduced in 1949 a Comparability Factor designed to compensate for the different age and sex composition of different areas; but we have had little information concerning its derivation. We are told that:

"The Birth Rate area comparability factors and the ratios of the local adjusted birth rates to the national rate shown in columns 9 and 10 of Table E serve a similar purpose to those shown for death rates, as explained in Section 7 below."

After explaining that the use of the factor is to aid comparability, Section 7 refers us to page 5 of the Statistical Review text published in 1938/1939—or a decade before the birth rate area comparability factor was devised. Little elucidation could therefore be expected or derived from this source. Two new publications, however, have recently changed this picture (General Register Office, 1953, 1954).

With the publication of the Census (ONE per cent. sample) Tables, we have, and for the first time in 20 years, accurate figures referable to populations of local areas, and this makes it possible to compute comparable fertility indices showing the force of fertility in each area. Accordingly, the following Tables show the comparative fertility in 1951 of large areas in England and Wales. Thus the birth rates for each area have been standardized by this indirect method, and the values (England and Wales = 100 in 1951) are valid measures of the fertility level of each area in that year.

In Table I, legitimate Live-Birth Rates for England and Wales in 1951 are calculated from births given in the Registrar-General's Review and the population estimated at the 1951 Census.

TABLE I

ENGLAND AND WALES 1951

Age of Mother at Maternity	No. of Married Women	Total Legitimate Live Births	Fertility Rate per 1,000 Married Women
15–19	61,400	24,299	395·75
20–24	722,900	177,936	246·14
25–29	1,267,200	211,296	166·74
30–34	1,297,300	134,592	103·75
35–39	1,418,000	73,599	51·90
40–44	1,388,700	21,557	15·52
45–49	1,259,500	1,479	1·17
Total			980·97

It is true that the Census Date, (midnight, April 8/9, 1951), was not located exactly at the centre of the year, but the final rates computed are not affected by this fact; and the Census figures are probably more accurate than the alternative, *viz.* the Registrar General's mid-year population. We may now apply the rates cited to each local population of married women to ascertain the number of births expected if their fertility rates were those of England and Wales (Table II).

*In receipt of a Research Fellowship from the Rockefeller Foundation.

TABLE II

REGIONS OF ENGLAND AND WALES (NORTHERN REGION)

Age of Mother at Maternity	Fertility Rate in England and Wales	Married Women in Northern Region	Expected Births
15–19	395·75	4,600	1,820
20–24	246·14	57,000	14,030
25–29	166·74	94,800	15,807
30–34	103·75	91,900	9,535
35–39	51·90	92,500	4,801
40–44	15·52	97,100	1,507
45–49	1·17	87,600	102
Total			47,602

Actual legitimate births = 51,900.
Expected legitimate births = 47,602.
Fertility = 109 per cent. of average for England and Wales.

Comparison of "expected" births with recorded births now gives us a picture of fertility for each local area compared with England and Wales. The values are summarized in Table III.

The difference between the Registrar-General's figures and those shown in Table III clearly demonstrates the limitations of the crude method. Thus, for example, the West Riding of Yorkshire, which is, in fact, some 6 per cent. below the fertility level for England and Wales, appears by the Registrar-General's method to be 1 per cent. above it. The method here set forth can of course be used for smaller areas than those shown when a reliable estimate of the age, sex, and marital status distribution is available.

REFERENCES

Taylor, W. (1950). "Birmingham and its Regional Setting". p. 261. British Association for the Advancement of Science.

General Register Office (1953)' "Statistical Review, Tables, Civil, 1952",p. *v*. H.M.S.O., London.

—— —— —— (1954). "Statistical Review, Text, Civil, 1946–50", p. 131. H.M.S.O., London.

TABLE III

COMPARATIVE FERTILITY RATES FOR 1951

Region	Expected Births (using England and Wales fertility)	Actual Legitimate Births	Fertility in 1951	Registrar-General's Ratio
England and Wales	644,742	644,758	100	100
Northern	47,602	51,900	109	114
East and West Ridings	63,885	61,250	96	103
North-Western	91,341	96,800	106	103
North Midland	52,612	51,213	97	105
Midland	69,709	68,318	98	103
Eastern	44,986	45,173	100	102
London and South-Eastern	159,503	148,050	93	88
Southern	37,464	39,190	105	103
South-Western	40,797	43,153	106	101
Wales	36,842	39,711	108	106
Conurbations				
Greater London	125,278	114,035	91	85
West Midland	35,601	34,849	98	102
West Yorks.	24,751	24,595	99	100
South East Lancs.	35,891	35,707	99	98
Merseyside	19,765	24,292	123	118
Tyneside	12,925	13,841	107	109
Large Administrative Counties and City				
Essex	24,578	22,431	91	93
Kent	22,576	21,964	97	97
Lancashire	28,352	28,563	101	96
London	52,672	48,790	93	91
Middlesex	32,756	29,124	89	80
Surrey	17,645	17,081	97	83
Yorks., West Riding	25,363	23,934	94	101
Birmingham	18,195	17,540	96	103

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A NOTE ON THE SEX DISTRIBUTION OF SIBS

BY

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It is remarkable that little attention has been given to the variation of the sex distribution of birth in the accountancy of housing policy in the present context of low fertility. When families are large, gross discrepancies between the number of girls and boys in a sibship will be rare; and the problem of providing separate accommodation for the sexes does not commonly assume a formidable aspect if there is agreement about the target mean. When sibships do not exceed two or three for a very large population the required number of houses with one or two bedrooms for the offspring assumes a matter of some importance, if, as at the present time, there is also a shortage of materials and accommodation.

If we assume equal probability of male and female birth and an exactly random distribution of 0 to r male births and 0 to r female births, in an r-fold sequence the proportions of sibships composed entirely of individuals of the same sex should be 0·5 for 2-child sibships, 0·25 for 3-child, 0·125 for 4-child, and 0·0625 for 5-child fraternities. If we assume floor-space for four children per room, one bed-room will suffice for half the families in a community of 2-child sibships, even if the second birth occurs before the first-born has left home. On the other hand, seven-eighths of the family will require two bedrooms and one bedroom would be adequate for only one-eighth, if all marriages led to the production of four surviving children; and this is so, even if the birth of the youngest ante-dates by 2 or 3 years the displacement of the eldest.

The foregoing considerations are admittedly schematic in the sense that:

(*a*) the sex ratio is not exactly unity;

(*b*) a variety of more or less atypical genetic phenomena, *e.g.* sex-linked lethals and non-disjunction, may conceivably conspire to raise the proportion of unisexual sibships above expectation in accordance with the assumptions stated.

However, the interest of such phenomena to the biologist may give rise to gross misconception concerning how widely observed sex distributions within sibships do in fact depart from such estimates. Indeed, the issue is on all fours with the prominence

TABLE I

OBSERVED AND EXPECTED SEX DISTRIBUTION OF SIBS

No. of Males	0	1	2	3	4	5	6	7	8	Total	Size of Sibship
Observed	79	81	—	—	—	—	—	—	—	160	1
$p = 0{\cdot}503$	80	80	—	—	—	—	—	—	—		
$p = 0{\cdot}5$	80	80	—	—	—	—	—	—	—		
Observed	50	94	54	—	—	—	—	—	—	198	2
$p = 0{\cdot}503$	49	99	50	—	—	—	—	—	—		
$p = 0{\cdot}5$	50	99	50	—	—	—	—	—	—		
Observed	17	56	49	20	—	—	—	—	—	142	3
$p = 0{\cdot}503$	17	53	54	18	—	—	—	—	—		
$p = 0{\cdot}5$	18	53	53	18	—	—	—	—	—		
Observed	3	12	22	12	6	—	—	—	—	55	4
$p = 0{\cdot}503$	3	14	21	14	3	—	—	—	—		
$p = 0{\cdot}5$	3	14	21	14	3	—	—	—	—		
Observed	1	4	7	8	1	0	—	—	—	21	5
$p = 0{\cdot}503$	1	3	6	7	3	1	—	—	—		
$p = 0{\cdot}5$	1	3	7	7	3	1	—	—	—		
Observed	0	0	1	3	1	0	0	—	—	5	6
$p = 0{\cdot}503$	0	0	1	2	1	0	0	—	—		
$p = 0{\cdot}5$	0	0	1	2	1	0	0	—	—		

once given in school geography books to the flattening of the earth's poles, a circumstance of considerable interest as confirmation of the Huyghens-Newton cosmogony, although in fact the discrepancy between the polar and equatorial axes is not such as to be of much interest to the practical navigator.

The object of this note is to emphasize that deviations of sex distribution from random expectation, if calculated in terms of the observed sex ratio, are not indeed of an order which need deter those concerned with housing policy from prospecting with as much precision as need be, requirements for houses with two or more rooms for sleeping accommodation on the understanding that children of opposite sex should sleep apart. Nor is the fact that the Registrar-General's reports regrettably provide no relevant large-scale information, an insuperable obstacle to the making of such estimates. The writer has analysed the only source of information known to him relevant to Great Britain at the present time, by using the data contained in "Who's Who" (1952) for all male entries whose surname begins with F, rejecting such as refer to the issue of a known second marriage.

These 718 entries refer to a total of 687 sons and 680 daughters for a highly skew distribution of sibship size with a range of 8 and a mean sibship size of 1·9. The sex ratio is 50·3 males to 49·7 females; and if we denote the probability of a male birth as $0{\cdot}503 = p$, we may alternatively assign a distribution on the assumption of randomness in accordance with the estimates $p = 0{\cdot}5$ and $p = 0{\cdot}503$. Table I fully summarizes the outcome of our sample analysis.

An examination of Table I suffices to show that computations on the basis of Mendelian expectation tally with observation as closely as we might wish for any practical purposes connected with housing policy; and this is so, even if we assume absolute equality of the sex ratio. For practical purposes what is relevant and confirmatory of the consideration stated at the outset can be ascertained from Table II, which sets forth the appropriate computation for a community of which we know the distribution of sibship size, if we wish to estimate the actual number of unisexual sibships, *i.e.* how many houses will require no separate accommodation for boys and girls, if one bedroom otherwise suffices for the accommodation of the sibship. The number of fertile unions recorded for this sample in accordance, with the exclusion of second marriages as mentioned, is here 160 + 198 + 142 + 55 + 21 + 5 = 585.

TABLE II
OBSERVED AND EXPECTED UNISEXUAL FAMILIES

Sibship Size	Number of Unisexual Families		
	Observed	Expected	
		$p = 0{\cdot}503$	$p = 0{\cdot}5$
1	160	160	160
2	104	99	99
3	37	35·5	35·5
4	9	6	6
5	1	2	2
6–8	0	0	0
Total ..	311	302	302

We thus obtain the following figures for a community with the given distribution of sibship size:

Observed proportion of *unisexual* sibships $\frac{311}{585} = 0{\cdot}535$

Expected proportion of *unisexual* sibships ($p = 0{\cdot}503$) $\frac{302}{585} = 0{\cdot}516$

Expected proportion of *unisexual* sibships ($p = 0{\cdot}5$) $\frac{302}{585} = 0{\cdot}516$

DISCUSSION

A systematic review of the literature has been made by Gini (1951), who claims that generally a marriage begins with the tendency to procreate one sex and ends with the tendency to procreate the opposite one. In a period when birth control is widely practised, this tendency, if real, might well result in a divergence from random expectation. The effect is however a complex feature, since for example families desiring a male child would tend to have an excess of female children as they would probably continue reproduction until one male child was born and then stop. Since the data do not distinguish parities we cannot analyse them in this way, and there seems no evidence here for such a belief.

REFERENCE

Gini, C. (1951). *Acta genet. (Basel)*, 2, 220.

Brit. J. prev. soc. Med. (1954), **8**, 180–186

ADMISSIONS TO SCOTTISH MENTAL HOSPITALS IN THE LAST HUNDRED YEARS

BY

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The increase in admissions to mental hospitals in Scotland since 1941 shows no sign of abating, and it seems proper to examine the phenomenon historically with the hope that information relevant to the present situation will emerge.

Before 1857 mental hospital statistics in Scotland were quite unreliable. There were in force three Acts of Parliament which were intended to regulate the confinement and treatment of the mentally ill and to make provision for the keeping of accurate records. Unfortunately, these Acts were so loosely worded and so ambiguous that they were almost impossible to administer.

Outside the seven new Scottish Royal Asylums the plight of the insane was indeed pitiable. An American woman, Miss Dorothea Lynde Dix, who had retired from school teaching and assumed as her mission in life the amelioration of conditions in prisons and lunatic asylums, with considerable success in her own country, visited Scotland in 1855 and inspected a number of asylums near Edinburgh. Finding their inmates badly treated and in a most miserable condition, she at once went to London and laid this information with much circumstantial detail before the Secretary of State for the Home Department, who decided that the evidence justified the appointment of a Royal Commission.

The Commission was appointed in the same year: "To inquire into the state of lunatic asylums in Scotland and the existing law in reference to lunatics and lunatic asylums in that part of the United Kingdom." The report was presented in 1857, and on its recommendations was based the Lunacy (Scotland) Act of 1857, which remains today the backbone of the Scottish lunacy code.

Possibly the most important result of this Act, which took effect on January 1, 1858, was the setting up of the General Board of Commissioners in Lunacy for Scotland and with it the machinery for recording accurate statistics of mental hospital admissions.

For the purpose of this paper it is convenient to divide the years between 1858 and 1953 into three parts and to describe admission trends within each period.

(*1*) *1858–89.*—The report of the Royal Commission included an estimate of the number of admissions to institutions in the 5 years, 1850–54. The average annual number of admissions to Scottish mental hospitals was 1,242, an admission rate of 0·43 per thousand of the Scottish population. (Table I).

TABLE I

ADMISSIONS TO SCOTTISH MENTAL HOSPITALS IN THE FIVE YEARS BEFORE THE APPOINTMENT OF THE ROYAL COMMISSION

Year	Number of Admissions	Rate per 1,000 Population	5-year Average	5-year Average Rate per 1000
1850	1,415	0·49	1,242	0·43
1851	1,163	0·40		
1852	1,168	0·40		
1853	1,324	0·46		
1854	1,138	0·39		

After the coming into effect of the 1857 Act the annual admission rate rose to 0·48 per thousand and at the same time a new kind of patient came under the surveillance of the authorities, the insane in private dwellings. These, added to the hospital admissions, brought the total annual average of admissions to the register of the insane to 1,718 and the rate to 0·57 per thousand. The figures for the insane in private dwellings are a little inflated by the numbers coming on the register just after the Act came into force.

In 1862 a third kind of patient appears—the voluntary patient. The Report of the Royal Commission had said this about voluntary admission:

> As an instance of the confidence reposed in the Medical Superintendent of Chartered Asylums, and as an indication that some diminution has taken place in the repugnance to asylums, which hitherto has been and still is so prevalent, we may mention that in many of the asylums a number of individuals have voluntarily presented themselves for admission.

There was no provision for voluntary admission in the 1857 Act, but the 1862 Act, which continued and amended the 1857 Act, permitted voluntary admission after the patient had obtained a medical certificate, and permission from the medical superintendent, and had made a declaration of his wish before a Sheriff. As Table II shows, patients were slow to take advantage of this new form of admission, partly, no doubt, because of the difficulty in complying with the formalities. A further amending Act of 1866, which took effect in 1868, made voluntary admission much simpler; the patient now required only the previous written consent of a Commissioner in Lunacy before he made application to the hospital for admission. This new legislation started an upward trend in voluntary admission which has continued to the present time.

TABLE II

ADMISSIONS IN THE PERIODS FOLLOWING THE LUNACY ACTS OF 1857, 1862, AND 1866

Year	Voluntary Patients	In Private Dwellings	Certified Patients	Total	Rate per 1,000 Population	5-year Average	5-year Average Rate per 1,000
1858	—	390	1,448	1,838	0·61	1,718	0·57
1859	—	176	1,422	1,598	0·53		
1860	—	125	1,442	1,567	0·51		
1861	—	129	1,496	1,625	0·53		
1862	2	82	1,374	1,458	0·47	1,540	0·50
1863	5	109	1,388	1,502	0·48		
1864	12	107	1,421	1,540	0·49		
1865	8	106	1,472	1,586	0·50		
1866	17	122	1,567	1,706	0·53		
1867	15	138	1,710	1,863	0·57	1,802	0·56
1868	27	112	1,716	1,855	0·57		
1869	33	65	1,903	2,001	0·61		

The year 1875 saw a particularly large increase in admissions consequent upon a Parliamentary Vote in that year, which contributed, from central government funds, 4s. a week towards the upkeep of every pauper lunatic in any asylum or licensed house, or in a private dwelling, the money to be paid to the Union or Parish from which the patient was sent. This had the effect of encouraging Parish Councils to transfer patients from poorhouses to asylums and thus added to the number of admissions.

Apart from the changes in admission rates which followed and were due to changes in the law, the period 1858 to 1889 is characterized by a fairly steady rise in admissions which keeps pace with the expansion and improvement of the mental hospital services. Table III summarizes the changes in this first period.

TABLE III

ADMISSIONS, 1858–89

Quinquennia	5-year Average	Average Rate per 1,000 Population
1858–59	1,718	0·57
1860–64	1,540	0·50
1865–69	1,802	0·56
1870–74	2,025	0·59
1875–79	2,479	0·69
1880–84	2,687	0·71
1885–89	2,723	0·70

(2) *1890–1939.*—The most important legislation in this period was the Mental Deficiency and Lunacy (Scotland) Act of 1913, by which the General Board of Commissioners in Lunacy for Scotland was reconstructed and designated the General Board of Control for Scotland. There was one extremely important amendment to the lunacy laws as well as a number of minor ones which had far-reaching effects on mental hospital admissions. This was an amendment to Section 15 of the 1866 Act which concerns voluntary admission. Referring to those wishing to be admitted, this new section says:

> It shall . . . be lawful for the superintendent to receive such person on his written application to that effect, provided that such person shall forthwith make written application to the board or to one of the Commissioners . . . and that such person shall not be detained for more than three days from the date of reception without the assent in writing of one of the Commissioners.

This means that voluntary admission was possible without any more formality on the part of the patient than the signing of two letters at the time of his admission to hospital. The effect on voluntary admissions was dramatic; the number of these, 181 in 1914, was 62 per cent. higher than in 1913, the last year in which the old Act was in force (Table IV).

TABLE IV

VOLUNTARY ADMISSIONS BEFORE AND AFTER THE MENTAL DEFICIENCY AND LUNACY ACT OF 1913

Years	Average Annual Voluntary Admissions
1900–05	78
1905–09	103
1910	108
1911	119
1912	115
1913	112
1914	181
1915–19	191

A most important provision of this Act was the duty laid on Parish Councils to provide special Institutions for mental defectives ascertained within their parish. Although these Institutions were intended for those mental defectives, "not being persons who can be dealt with as lunatics under the

Lunacy Acts", a number of persons were admitted to institutions for defectives who would previously have been mental hospital patients.

The Local Government (Scotland) Act of 1929, which abolished the district Boards of Control and placed the mental hospitals in the charge of the County Councils, had little direct effect on admissions, but, by contributing to the smoother running of the service, played its part in improvement of conditions.

To return to the general problem of changes in admissions, illustrated in Table V, in this period the rise in admission rates is halted; at first rates are fairly steady at about 0·80 per thousand with small fluctuations, but in the last decade there is a small but definite fall of about 10 per cent. The same expansion and improvement of the hospital services, which appeared to have caused the increase of admission rates in the previous period, have continued for the first two decades of this, but have failed to have the same effect. One need not look far for an explanation.

TABLE V

ADMISSIONS, 1890–1939

Quinquennia	5-year Average of Total Admissions	Average Annual Admission Rate per 1,000 Population
1890–94	3,164	0·78
1895–99	3,492	0·81
1900–04	3,758	0·83
1905–09	3,667	0·79
1910–14	3,795	0·80
1915–19	3,864	0·77
1920–24	4,016	0·82
1925–29	3,892	0·80
1930–34	3,666	0·75
1935–39	3,596	0·72

In 1906 the forty-eighth Annual Report of the General Board of Commissioners in Lunacy includes a section on wards for the observation and treatment of temporary mental disorder.

Small wards of the kind, containing six beds for each sex, were, however, with our knowledge and approval established by the Parish Council of Glasgow at Barnhill Poorhouse so far back as 1890. The success attending this experiment was so great as to induce the Glasgow Parish Council to provide special wards for the purpose, containing 25 beds for each sex in connection with their new parochial hospital at Duke Street, Glasgow. These wards, which are spacious and handsome and admirably designed and equipped for their purpose, were opened in 1904.

In the Seventh Annual Report (1921) the Board of Control comments on the undoubted success of the Glasgow experiment, which was followed by similar enterprises by the Parish Councils of Dundee, Govan, and Paisley. The Ninth Annual Report (1923) records the establishment of new observation wards in the Southern General Hospital at Stobhill in Glasgow:

> Four wards, each accommodating 20 patients, have been set aside for the treatment of all cases of incipient, temporary and unconfirmed mental disorders arising in Glasgow parish.

The first mention of the numbers of patients being cared for in these new observation wards was made in the Board of Control's Eleventh Annual Report (1925), which gives the admissions and discharges in the year 1924 for Stobhill and Duke Street hospitals in Glasgow as 1,293 admitted, 399 recovered, 214 improved, 411 sent to asylums, and 91 died.

Some years later, in May of 1929, the Jordanburn Nerve Hospital was opened in Edinburgh. This hospital, which is not a mental hospital or an observation ward, provides treatment for cases of early nervous and mental disorder and has no admission formalities. The accommodation is fifty beds, and, as patients remain in for a very much shorter time than in mental hospitals and never for longer than a year, the turnover is relatively enormous.

The total effect of the opening of these observation wards and finally of the Jordanburn Hospital must have been to reduce mental hospital admissions, and it seems reasonable to suggest that but for this, the upward trend noted in the last period might have continued.

Table VI demonstrates two very interesting points. The first is a minimum point in admission rates in 1917, which, at 0·70 per thousand of the population, was 9·1 per cent. below the 5-year average. A number of factors seem to be involved: the mental

TABLE VI

ADMISSIONS BEFORE, DURING, AND AFTER THE FIRST WORLD WAR

Year	Voluntary Patients	Patients in Private Dwellings	Certified Patients	Total	Rate per 1,000 Population	5-year Average	Rate per 1,000
1910	108	133	3,312	3,553	0·75		
1911	119	132	3,571	3,822	0·80		
1912	115	120	3,464	3,699	0·78	3,795	0·80
1913	112	103	3,679	3,894	0·82		
1914	181	72	3,752	4,005	0·84		
1915	146	69	3,607	3,822	0·80		
1916	185	57	3,435	3,677	0·77		
1917	186	36	3,133	3,355	0·70	3,684	0·77
1918	175	27	3,456	3,658	0·76		
1919	263	27	3,619	3,909	0·81		
1920	313	44	3,704	4,061	0·83		
1921	346	35	3,855	4,236	0·87		
1922	369	32	3,854	4,255	0·87	4,016	0·82
1923	381	33	3,419	3,833	0·78		
1924	431	30	3,232	3,693	0·76		

hospital service was to some extent given over to the treatment of military casualties, and the staff, medical and nursing, was depleted by the needs of the Services, but a very important factor must have been that the people as a whole were co-operating in a common task which left personal difficulties and rivalries at a minimum.

The second point is the post-war rise in admission rates, which may be due partly to removal of the cohesive properties of wartime conditions, and partly to demobilized men having to shoulder anew or for the first time responsibilities, personal and family, in a competitive society. The post-war rise was stemmed in 1923 by the expansion of the observation wards.

(*3*) *1940–53.*—The most important legislation in this period was the National Health Service (Scotland) Act of 1947, which amended the law affecting lunacy in many ways. Most mental hospitals were vested in the Secretary of State for Scotland, and treatment, which had previously been charged for accordng to the patient's means, became available to all without charge. A number of Poor Law Institutions were taken over by the Secretary of State as general hospitals, and, during the first year or so of the new service, many of their most troublesome patients were certified and transferred to mental hospitals. In 1949, the first full year of the new service, the admission rate rose by 18·5 per cent., 19·2 per cent. above the 5-year average.

Table VII shows two phenomena very similar to those shown by Table VI—a low point during the war and a post-war rise in admissions. The low point occurred in 1941, when, at 0·66 per thousand, the rate was lower than it had been since 1879. The same factors seemed to operate as in 1917; at both periods the country was hard pressed but morale was generally good. The post-war rise was much steeper than the previous one and has been maintained longer. No relief such as that afforded by the observation wards has been forthcoming.

Table VIII summarizes admission trends in this most recent period.

TABLE VII

ADMISSIONS BEFORE, DURING, AND AFTER THE SECOND WORLD WAR

Year	Voluntary Patients	Patients in Private Dwellings	Certified Patients	Total	Rate per 1,000 Population	5-year Average	Rate per 1,000
1935	855	4	2,694	3,553	0·72		
1936	900	5	2,564	3,469	0·70		
1937	1,013	8	2,735	3,756	0·75	3,596	0·72
1938	1,109	—	2,491	3,600	0·72		
1939	1,299	—	2,303	3,602	0·72		
1940	1,102	—	2,231	3,333	0·69		
1941	1,058	—	2,136	3,194	0·66		
1942	1,306	—	2,148	3,454	0·73	3,524	0·74
1943	1,423	—	2,240	3,663	0·79		
1944	1,845	—	2,125	3,970	0·85		
1945	1,945	—	2,187	4,132	0·88		
1946	2,243	—	2,243	4,725	0·96		
1947	2,760	—	2,381	5,141	1·00	5,203	1·04
1948	3,156	—	2,437	5,593	1·08		
1949	3,702	—	2,724	6,426	1·24		
1950	3,975	—	2,652	6,627	1·30		
1951	4,446	—	2,581	7,027	1·38		
1952	5,054	—	2,519	7,573	1·49	7,076	1·43
1953	5,375	—	2,581	7,956	1·56		

TABLE VIII

ADMISSIONS, 1930–53

Quinquennia	5-year Average	Average Annual Rate per 1,000 Population
1930–34	3,666	0·75
1935–39	3,596	0·72
1940–44	3,524	0·74
1945–49	5,203	1·04
1950–53	7,296	1·43

DISCUSSION

The most important trend in admissions since 1858 has been upwards. This movement was slowed in the 1890s and was halted at the beginning of the 20th century, to be resumed again during the 1939–45 war. There can be little doubt that the most important influence in keeping down admissions in the 40 years 1904 to 1944 was the institution of observation wards in the West of Scotland and Dundee and the Jordanburn Nerve Hospital in Edinburgh. These hospitals admitted patients who would otherwise for the most part have entered mental hospitals. It should be a fairly simple matter, if the records are available, to see if the curve formed by successive annual admission rates is smoothed when the admission to these institutions is added to the mental hospital admissions.

This leaves us with the increases themselves to explain. Others have made their comments in the past, notably the General Board of Commissioners in Lunacy and their successors, the General Board of Control. The 24th Annual Report of the Board of Commissioners (1882) discusses in great detail the rise in admissions following the government grant of 4s. per head per week towards the upkeep of pauper patients. The 29th Annual Report (1887) points out that, since the grant, local government expenditure had increased rather than diminished because of the increased number of patients chargeable to the rates.

The 34th Report (1892) summarizes reasons for the increase given in previous reports:

"(1) The erection of new asylums for pauper lunatics—specially affecting localities in which no asylum accommodation for pauper lunatics previously existed.

(2) The readier means of access to asylums due to increased facilities for travelling.
(3) The gradual dying out among the public of feelings of dislike and suspicion towards asylums, a change which has resulted in an increasing recognition on the part of the community of the humane and enlightened methods of modern treatment and curative influences generally which modern asylums afford.
(4) The greater readiness among the poorer classes to send relatives to asylums as pauper lunatics, which is due in part to the cause just mentioned, but also in part to a strengthened conviction of the difference which exists between the acceptance of parochial relief in cases of insanity and its acceptance under other conditions.
(5) The growing unwillingness of the poorer classes to submit to all that is involved in keeping an insane relative at home—the discomfort which usually results from the presence of an insane person in a small house, the expense of supporting a member of the family who is unable either to earn wages or to do household work, and the diminution of the earnings of the healthy which the care of the insane relative often involves.
(6) The greater willingness of parochial authorities to recognize claims to parochial relief on the ground of insanity.
(7) The stimulus both to the readiness to seek relief and to the willingness to afford it, which has resulted from the giving of a State grant-in-aid towards the cost of maintenance of pauper lunatics.
(8) The widening of medical and public opinion as to the degree of mental unsoundness which may be certified to be lunacy."

The Board in this report stated their belief that there was no true increase in lunacy in Scotland. Further comment is made in the 35th Report (1893), and by the time the next report was ready for publication a question had been asked in Parliament.

Mr. John Redmond: "I ask the Secretary of State for Scotland, with regard to the fact that the number of insane persons under official cognizance in Scotland has increased from 6,341 in 1862 to 13,058 in 1892, whether the increase is believed to be real or only apparent, and whether he has called, or intends to call, for a special report on this subject, similar to that called for by the Chief Secretary to the Lord Lieutenant of Ireland." (*Monday, May* 7, 1894).

The increase was real enough. The patients were there in the wards of the Scottish mental hospitals, and, on the same day that the question was tabled, a letter was sent from the Secretary of State requesting a special report respecting "the alleged increasing prevalence of insanity in Scotland."

This special report, which was published as a supplement to the 36th Annual Report (1894) of the Board of Lunacy, is a really excellent piece of work. Its main part consists of three statistical papers, each taking certain aspects of the problem and examining it minutely.

The first paper, by Sir Arthur Mitchell, K.C.B., Commissioner in Lunacy, is concerned solely with increased numbers of persons in hospitals and not with admissions to hospitals, and, although it is of considerable interest, deals with aspects of this matter which do not directly concern the present problem.

The second paper, by John Sibbald, M.D., Commissioner in Lunacy, comments on a number of very important facts. After a brief historical survey, he shows that much of the increase in pauper lunacy was in fact due to a rise in the Scottish population. He then shows, from figures given in the 1857 Royal Commission Report, that in 1855 the number of pauper lunatics in the various kinds of establishment varied considerably in different parts of the country, Edinburgh having 177 per hundred thousand and Shetland 29 per hundred thousand, the figure for Scotland as a whole being 88. This difference is associated with mental hospital provision, Edinburgh having a large hospital, Shetland none. The effect of the 1857 Act was to keep Edinburgh with a fairly constant proportion of residents in asylums and level up the rest of the country, so that, in 1874, while the rate in Edinburgh was 187 per hundred thousand, in the worst county it was 142 per hundred thousand, and in Scotland as a whole it was 151. In the meantime the poorer districts had built or acquired asylum accommodation and thus brought their provision of mental beds nearer to the Edinburgh level.

Next he examines the admission trends for private patients as being a class of person less likely to be affected by poor hospital provision. He finds there is very little change in their admission rates, but at the same time the number in residence is constantly increasing (Table IX).

TABLE IX
ADMISSIONS AND RESIDENTS UP TO THE TIME OF THE SCOTTISH SPECIAL REPORT

Quinquennia	Per 100,000 Population	
	Average Annual Admissions	Average Numbers Resident
1860–64	12·4	33
1865–69	13·3	35
1870–74	12·8	37
1875–79	13·5	38
1880–84	11·9	38
1885–89	12·2	40
1890–94	13·4	43

He quotes the numbers of imbeciles and insane enumerated in the Census reports of 1871, 1881 and 1891 as being respectively 340, 385, and 384 per 100,000 of the population, which suggests that,

although their numbers are accumulating in asylums, the number in the general population and, therefore, probably the incidence of new cases is not increasing appreciably, the real change being in the increased use of asylums.

The third paper, by T. W. L. Spence, Secretary to the Board, goes more deeply into the problem of the private patient. He finds that the number of private patients admitted per thousand income tax assessments has not changed over the years and that the number of private patients per thousand families living in houses of seven rooms and upwards is also unaltered, and so concludes that the class of patient admitted as private is not changing and that the increase in pauper patients is not due to the admission of people who would formerly have been registered as private.

All three authors state their belief that there is no increased tendency to lunacy in Scotland, that the special conditions of modern life play no part in the increase of admissions, but that the increase is due to changes in the hospitals and in the hospital service.

As is mentioned in the question asked in the House of Commons by Mr. Redmond, the Inspectors of Lunatics in Ireland had already, in February, 1894, made a special report to the Chief Secretary on the subject of "The alleged increasing prevalence of insanity in Ireland". The Irish report took the form of the analysis of a questionnaire sent to all the Resident Medical Superintendents of the District Asylums of Ireland, asking for statistics of all admissions, distinguishing various categories of patient, and in particular, first admissions, transfers, and readmissions, and all inmates by age and sex at two separate periods. At the same time the Superintendents are asked their opinions of the causes of the increase in numbers resident in institutions. They also examined the Census returns of the insane at 1851, 1861, 1871, 1881, and 1891.

The Irish Inspectors in Lunacy draw conclusions far beyond the facts displayed in their brief report. They do, however, give a very useful fact not given in any of the Scottish papers, that there is an increase in first admissions in the period under review. As an appendix to their report they give a graph of total admissions and first admissions in the period 1883–92. The first admission-curve mirrors that of total admissions fairly closely, naturally at a lower level, and does not increase quite as steeply, showing that the proportion of readmissions is slowly increasing.

Just three years later, in February, 1897, the English Commissioners in Lunacy presented a special report to the Lord Chancellor on "The Alleged Increase of Insanity". This report is full of interesting material; especially there are category breakdowns of the statistics, which were not available in the Scottish or Irish special reports. Like the officials in the other two countries, the attention of the Commissioners has been drawn to the great increase in numbers of insane in institutions, but, when dealing with admissions and admission rates, the increase, they say, is not nearly so apparent.

The increase is of about the same order of magnitude as that in the Scottish and Irish rates, amounting to about 20 per cent. in the 10-year period 1886–95. The same trend is found in first admissions in England. The rates for the three countries are compared in Table X.

TABLE X

COMPARISON OF ADMISSION RATES IN SCOTLAND, ENGLAND AND WALES, AND IRELAND UP TO THE TIME OF THE ENGLISH SPECIAL REPORT

Year	Total Admission Rate per 1,000 Population		
	Scotland	England and Wales	Ireland
1869	0·61	0·47	—
1879	0·66	0·52	—
1886	0·67	0·49	0·61
1887	0·67	0·51	0·65
1888	0·71	0·53	0·63
1889	0·72	0·53	0·66
1890	0·74	0·56	0·69
1891	0·77	0·57	0·67
1892	0·77	0·58	0·71
1893	0·79	0·60	0·72
1894	0·81	0·59	0·72
1895	0·78	0·61	0·72

The English Commissioners, like the Scottish and the Irish, examined the Census returns of the insane in the population, paying particular attention to the excess of the numbers registered by census enumerators over the numbers registered by the Commissioners. They show that this excess, amounting to 17·7 per cent. of the Census figure in 1871, declines to 13·5 per cent. in 1881, and to 10·8 per cent. in 1891, showing that increasing proportions are finding their way on to the Commission's register.

The report finishes with an appendix showing the analysis of the replies to a circular letter, on the Irish pattern, addressed to Superintendents of all Borough and County asylums.

There appears to be little to add to the comments of the Scottish and English Commissioners and of the Irish Inspectors about what was very much the same problem, the increases in admissions to institutions and the consequent increase in residents in asylums which took place up to the end of the 19th and was continued for a short while into the 20th century.

Whether these increases would have continued in Scotland but for the opening of the observation wards, as has already been said, is a matter for future research. Lewis (1946), in an admirable statistical paper, shows that, within the period 1907–37 in England and Wales, a decline in first attack admission rates at all ages over 35 years persisted up to 1930, and that, for the age group 65 and over, this decline continued till 1937. He attributed the decline to the increasing use of workhouses and public assistance institutions, and in London, of observation wards, a reversal of the trends reported by the Commissioners in the previous period.

In Scotland since 1941, admission rates have been going up at an alarming rate and so far there is no sign of this tendency stopping. Many factors making for increase which have previously been noted are again operative, and there has been no relief by the opening of new observation wards or similar units in this period or for a long time before:

(1) The mental hospital service is improving and nothing has contributed more to this improvement than the introduction of the new forms of physical treatment which were developed just before this period and brought into general use in Scotland about the time when admissions began to rise again. These treatments by their dramatic immediate effects give new hope to both patients and staff. About this time also a number of institutions dropped the title "asylum" and took for themselves new names. They became "mental hospitals"; their attendants became "nurses", and their doctors later returned from the Services with new reputations from both patients and colleagues gained during the war. Clearly, patients now had much more confidence in the transformed mental hospitals, for there was a remarkable effect on voluntary admissions, which rose by 23 per cent. between 1941 and 1942, 29 per cent. between 1943 and 1944, and 27 per cent. between 1945 and 1946.

The National Health Service facilitated improvements in mental hospital care. The financial burden on the family of a relative in hospital was greatly reduced when hospital treatment became free and patients in hospitals enjoyed more amenities than they had done previously. In one respect the National Health Service aggravated the problem of accommodating the mentally ill. At the appointed day poorhouses were not all taken over by the Secretary of State, and the patients then housed in them were transferred to the already crowded mental hospitals; in addition a number of poorhouse inmates, who had lived there under no legal restraint, were in the first 18 months of the new service certified and admitted to mental hospitals, causing in 1949 a fairly steep rise in certified admissions.

The total effect of these improvements on voluntary admissions was remarkable; between 1941 and 1953 they rose by over 400 per cent. Should there be any doubt that improved conditions and not a rise in the susceptibility of the population to mental illness is the cause of these increased admissions, it should be possible to demonstrate a smaller increase in admission rate in the better-off sections of the community for whom pleasant conditions in mental hospitals have always been available.

(2) Readmissions may form a higher proportion of total admissions now than they did before the war. Unfortunately, the Board of Control figures are given for total admissions only. For certified admissions it would be simple to ascertain the proportion of first admissions, but for voluntary admissions this would be very difficult. However, it would not be impossible, and the contribution of readmissions to the increase must be discovered if we are to achieve an explanation of these admission trends.

(3) Ours is an ageing population, and, as admission rates to mental hospitals rise to a maximum in old age, as has been shown for a part of Scotland in a recent and as yet unpublished survey of mental illness in Edinburgh, any increase in the later age groups will cause an increase in the admission rates as a whole. Information about the age distribution of admissions is not available from the Board of Control records, but it could be obtained from the individual mental hospitals.

(4) Another demographic reason for the increase in admissions is that families are getting smaller, and that the burden of looking after a mentally sick person at home is, by being shared among fewer people, becoming correspondingly greater.

Summary

The available evidence indicates that increases in admissions to Scottish mental hospitals are to be explained by improvements in the mental hospital services, by changes in the law relating to mental hospital admission, and by changes in population structures, rather than by such concepts as the increasing stress and strain of modern life. Whether there is a residual increase, which is in fact due to a greater liability to mental illness, can only be decided by, amongst other things, such researches as are suggested in this paper.

I am grateful to Professor F. A. E. Crew for his help, for his ideas, and for the opportunity to do this research. I must also thank the General Board of Control for Scotland for the material on which this paper is based and for their very generous help and criticism.

REFERENCES

Commissioners in Lunacy (England) (1897). "Special Report to the Lord Chancellor on the Alleged Increase of Insanity". H.M.S.O., London.

—— —— (Scotland) (1858–1913). Annual Reports. H.M.S.O., London.

—— —— —— (1895). Supplement to 36th Annual Report (1894), "Report on Alleged Increasing Prevalence of Insanity in Scotland". C. 7610, H.M.S.O., London.

General Board of Control for Scotland (1914–1938). Annual Reports. H.M.S.O., London.

Inspectors of Lunatics in Ireland (1894). Special Report to the Chief Secretary, "Alleged Increasing Prevalence of Insanity in Ireland". C. 7331, H.M.S.O., London.

Lewis, A. J. (1946). *J. ment. Sci.*, 92, 150.

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